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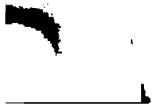
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A NEW SYSTEM

OF

MERCANTILE ARITHMETIC;

ADAPTED TO THE

Commerce of the United States,

IN ITS

DOMESTIC AND FOREIGN RELATIONS,

WITH

FORMS OF ACCOUNTS,

AND

OTHER WRITINGS USUALLY OCCURRING IN TRADE.

BY MICHAEL WALSH, A. M.

ITER EST BREVE PER EXEMPLA.—SENECA.

FOURTH EDITION.

TO WHICH IS ANNEXED A

SYSTEM OF BOOK-KEEPING

SALEM:
PUBLISHED BY CUSHING AND APPLETON, (PROPRIETORS.)

Printed by J. D. Cushing & Brothers.
1822.

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DISTRICT OF MASSACHUSETTS, to wit:

District Clerk's Office.

SEAL. BE IT REMEMBERED, That on the twenty-first day of July, A. D. 1814, in the thirty-ninth year of the Independence of the United States of America, *Edward Little & Co.* of the said district, have deposited in this office the title of a book, the right whereof they claim as proprietors, in the words following, to wit:

"A New System of Mercantile Arithmetic; adapted to the Commerce of the United States, in its Domestic and Foreign Relations; with forms of Accounts, and other Writings usually occurring in Trade. By Michael Walsh, A. M. Iter est breve per exempla.—Seneca. Fourth Edition."

In conformity to the act of the Congress of the United States, entitled, "An Act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies, during the times therein mentioned;" and also to an act, entitled "An Act, supplementary to an act, entitled, 'An Act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies during the times therein mentioned, and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints.'"

WM. S. SHAW,
Clerk of the District of Massachusetts.

SALEM, JANUARY 8, 1818.

THE subscribers hereby inform the public that they have this day purchased of E. LITTLE & Co. the above Copy Right, and solicit the orders of the trade, and others, for the work.

CUSHING & APPLETON.

RECOMMENDATIONS.

Newburyport, May 1, 1800.

WE the subscribers having seen Mr. WALSH'S New System of MERCANTILE ARITHMETIC, and being satisfied that it is better calculated, than any yet published, to fit a youth for the business of the Compting-House, cannot but wish it an extensive circulation. The happy elucidation and extended application of the common rules, together with the many original improvements, while they accomplish the student for commerce, are also extremely well adapted to assist and inform the merchant, the mariner and the trader, in their various occupations.

Dudley A. Tyng,
Ebenezer Stocker,
William Bartlett,
Samuel A. Otis, jun.
Tristram Coffin,
Moses Brown,
William Wyer, jun.
Richard Bartlet, jun.
William W. Prout,
Michael Little.

Boston, May 16, 1800.

WE the subscribers, having examined Mr. WALSH'S New System of MERCANTILE ARITHMETIC, and being persuaded that it is better calculated than any we have met with, to qualify young men for admission into Compting-Houses, we wish that it may have an extensive circulation. The clear exemplification and pertinent application of the common rules, together with the many useful additions and improvements which it contains, will render it extremely useful for the merchant, the mariner, and all the other trading classes of society.

Marston Watson,
John C Jones,
John Codman,
Stephen Higginson,
John Lowell jun.
Joseph Russell,
Arnold Wells, jun.
Jonathan Jackson.

Salem, October 7, 1800.

WE the subscribers, merchants of Salem, convinced of the necessity of rendering the forms of business, the value of coins, and the nature of commerce, more familiar to the United States, as a commercial people, do approve of the MERCANTILE ARITHMETIC of Mr. WALSH, and recommend it as calculated to subserve in the best manner the instruction of our youth, and the purposes of a well informed merchant.

Wm. Gray, jun.
Benj. Hodges,
Benj. Pickman,
Nath. Bowditch,
Jacob Ashton,
Wm. Prescott,
Jacob Crowninshield,
Elias Hasket Derby.

PREFACE

TO THE THIRD EDITION.

THE merit of WALSH'S MERCANTILE ARITHMETIC having been submitted to the public, and established by the most liberal and unequivocal encouragement, the Editor feels a confidence in offering a third edition of ten thousand copies.

It is unnecessary now to urge the superiority of this over every similar production extant. The discernment of men of letters, and the generous spirit of a commercial public, have rendered panegyric useless by an unprecedented patronage. In the very short period of its existence two extensive impressions have been circulated through the country, and orders are already received for a very large proportion of the third.

The value of any work must be decided by those to whom it is more immediately useful; and if such persons possess the means of discrimination, the decision will undoubtedly be correct. The present publication is adapted as well to assist the researches of Mathematicians, as to facilitate the negociations of Merchants. Such characters have

supported it by their written approbation, and recommended it by an introduction into their own Studies and Compting-Rooms. Schools and Academies have made it the basis of a mercantile education, and it has become an indispensable assistant to every trading class of the community.

This impression has received several valuable additions under the general head of Exchange, including the existing exchange with Antwerp, Trieste, Genoa, Venice, Barcelona and Palermo in Sicily, and many useful rules under each of these particular heads. A new subject is likewise added, entitled "ARBITRATION OF EXCHANGE," the importance of which will easily be seen by Merchants whose remittances may travel through several countries, and be liable to the rates of exchange in each.

The errors of the last edition were few and unimportant. But to render the work perfect, they have been minutely considered and corrected.

The Editor is confident that the present edition will be taken up with the same avidity as the two former, and he assures the public that the work shall not suffer either in accuracy or beauty, by the liberality of its patrons.

EDMUND M. BLUNT.

September, 1804.

PREFACE

TO THIS EDITION.

THERE is subjoined to this edition an *Introduction to Book-Keeping*, on the plan of R. Turner, LL.D. with a Waste Book, as an example for practice, corrected and improved, and calculated for the merchants and traders in the United States. Great simplicity has been used, in order that the learner may attain to a *clear view of the principles of this science*, in which being once well grounded, he may apply them to the diversified objects and transactions of complicated and extensive commerce.

This treatise has received the approbation of our most intelligent merchants.

It was not judged worth while to have an example of Book-Keeping by *single entry*, as the *first rudiments* in this treatise will be a sufficient guide to that mode.

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EXPLANATION

OF THE

CHARACTERS USED IN THIS WORK.

= SIGNIFIES equality, or equal to: as, 20 shillings = one pound: that is, 20 shillings are equal to 1 pound.

+ Signifies more, or Addition: as 6+6=12: that is, 6 added to 6 is equal to 12.

— Signifies less, or Subtraction: as, 6—2=4: that is, 6 less 2 is equal to 4.

× Signifies Multiplication: as, 6×2=12: that is, 6 multiplied by 2 is equal to 12.

÷ Signifies Division: as 6÷2=3: that is, 6 divided by 2 is equal to 3.

Division is sometimes expressed by placing the numbers like a fraction, the upper figure being the dividend, and the lower the divisor: thus, $\frac{54}{6}=9$: that is, 54 divided by 6 is equal to 9.

: : : : Proportion: as, 3 : 6 :: 9 : 18; that is, as 3 is to 6, so is 9 to 18.

$\surd$ Prefixed to any number, signifies that the square root of that number is required.

A line or vinculum, drawn over several numbers, signifies, that the numbers under it are to be considered *jointly*; as $8-\overline{3+4}=1$; but without the line, $8-3+4=9$.

MERCANTILE ARITHMETIC.

ARITHMETIC is the art of computing by numbers, and has five principal rules for this purpose, viz. *Numeration*, *Addition*, *Subtraction*, *Multiplication*, and *Division*.

NUMERATION

Teacheth to express any proposed number by these ten characters, 0. 1. 2. 3. 4. 5. 6. 7. 8. 9.—0 is called a cypher, and the rest figures or digits; the relative value of which depends upon the place they stand in, when joined together, beginning at the right hand, as in the following

TABLE.

hundreds of millions.	tens of millions.	millions.	hundreds of thousands.	tens of thousands.	thousands.	hundreds.	tens.	units.
9	8	7	6	5	4	3	2	1

Though the table consists only of nine places, yet it may be extended to more places at pleasure; as, after hundreds of millions, read thousands of millions, ten thousands of millions, hundred thousands of millions, then millions of millions, &c.

TO WRITE NUMBERS.

RULE. Write down the figures as their values are expressed, and supply any deficiency in the order with cyphers.

EXAMPLES.

Write down in proper figures the following *numbers.*

Twenty-nine,
Two hundred and forty-seven,
Seven thousand nine hundred and one,
Eighty-four thousand three hundred and twenty-nine,
Nine hundred and two thousand six hundred and fifteen,
Eighty-nine millions and ninety,
Four millions four hundred thousand and forty,
Nine hundred and nine millions nine hundred and ninety,
Seventy millions seventy thousand and seventy.

Eleven thousand eleven hundred and eleven.		Fourteen thousand fourteen hundred and fourteen.	
eleven thousand	11000	fourteen thousand	14000
eleven hundred	1100	fourteen hundred	1400
eleven	11	fourteen	14
Total	12111	Total	15414

To express in words any number proposed in figures.

RULE. To the simple value of each figure, join the name of its place, beginning at the left hand and reading towards the right.

EXAMPLES.

Write down in words the following numbers.

46, 199, 2267, 86693, 289732, 11911911, 1169990, 9919, 4320, 55000510.

SIMPLE ADDITION

Teacheth to collect numbers of the same denomination into one sum.

EXAMPLES.

galls.	yds.	bushels.
68965	59473	875496
14753	8914	170900
29684	675	574
57693	29	9
171095		
171095		

galls.	yds.	bushels.
17573	180041	750010
468	4095	31994
57	83	573
9	7326	74837

As the mercantile method of proving addition is to reckon downwards, as well as upwards, the sums of which will be equal, when the addition is just, two spaces are left for the work.

SIMPLE SUBTRACTION

Teacheth to take a less number from a greater of the same denomination, and thereby to show the difference.

EXAMPLES.

	yds.		galls.
From	57468532	From	29689141
Take	26587491	Take	17938762
Rem.	30881041	Rem.	11750379
Proof	57468532	Proof	29689141

3.	from 924357	take	565383	Rem. 358974
4.	517684		291872	225812
5.	510090		191939	318151
6.	191191		2957	188234
7.	291619		829	290790
8.	500910		15723	485187

SIMPLE MULTIPLICATION

Is a compendious way of adding numbers of the same name.

The number to be multiplied is called the *multiplicand.*
The number which multiplies is called the *multiplier.*
The number arising from the operation is called the *product.*

MULTIPLICATION TABLE.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

EXAMPLES.

Multiplicand	5965468	4765293	6281947
Multiplier	2	3	4
Product	11930936	14295879	25127788

4. Mult.	2658758	by 5	product	13293790
5.	9674372	6		58046232
6.	7689657	7		53827599
7.	2674876	9		24073884
8.	4198543	10		41985430
9.	7491685	11		82408535
10.	2689489	12		32273868
11.	1768735	20		35374700
12.	2891496	400		1156598400
13.	5749857	78		448488846
14.	2653294	872		2313672368
15.	78965987	5893		465346561391
16.	562916859	490070		275868665090130

SIMPLE DIVISION

Teacheth to find how often one number is contained in *another of the same* name.

The number given to be divided, is called the *dividend*.
The number by which to divide, is called the *divisor*.
The number of times the *divisor* is contained in the *dividend*, is called the *quotient*.
The *remainder*, if there be any, will be less than the *divisor*.

PROOF.

Multiply the quotient by the divisor; to the product add the remainder, and the sum will be equal to the dividend, if the work be right.

EXAMPLES.

	Dividend.	
Divisor	2)694568946	3)2768954584
Quotient	347284473	922984861—1 rem.
	2	3
Proof	694568946	2768954584

	Dividend.	Quotient.
Divisor	52)6495436(	124912
	52	52
	129	249824
	104	624560
	255	12 rem.
	208	6495436 proof.
	474	
	468	
	63	
	52	
	116	
	104	
	12	

			Quotient.	rem.
4. Divide	8965462 by	6 Ans.	1494243 and	4
5.	3723675	8	466084	3
6.	4654682	9	517186	8
7.	2768967	10	276896	7
8.	1949952	11	177268	4
9.	2968967	12	247413	11
10.	5268794	20	263439	14
11.	29619145	40	740478	25
12.	419825367	500	839650	367
13.	296876234	64	4638691	10
14.	47989536925	735	65291886	715
15.	26574983184	8962	2965296	432
16.	53479689236	7684	6959876	2052
17.	4917968967	2359	2084768	1255
18.	3258675689	67435	48323	14184

When the divisor is a compound number, that is, if any two figures, being multiplied together, will make that number, then divide the dividend by one of those figures, and the first quotient by the other figure, and it will give the quotient required. But as it sometimes happens that there is a remainder to each of the quotients, and neither of them the true one, it may be found by this

RULE. Multiply the first divisor by the last remainder, and to the product add the first remainder, which will give the true one.

EXAMPLES.

Divide 296876234 by 64

8)296876234

8)37109529—2

Quotient 4638691 and $1 \times 8 + 2 = 10$ remaining.

Divide 8757635 by 28

Quotient 312772 and 19 rem.

Divide 18957492 by 42

451368 and 36 rem.

Divide 1571196 by 72

Quotient 21822 and 12 rem.

Divide 3751749 by 96.

39080 and 69 rem.

MISCELLANEOUS QUESTIONS.

1. Add 562163, 21964, 56321, 18536, 4340, 279, and 83 together. Ans. 663686.

2. What number is it, which being added to 9709 will make 110901? Ans. 101192.

3. General WASHINGTON was born in the year 1732; how old was he in 1799? Ans. 67 years.

4. Add up twice 397, three times 794, four times 3176, five times 15880, six times 95280, and once 333040. Ans. 1000000.

5. A cashier received, viz. four hundred and nine dollars, twenty thousand and thirteen dollars, eight thousand five hundred and ten dollars, nine hundred and twenty-eight dollars; of which he paid away fifteen thousand fifteen hundred and fifteen dollars: what was the whole sum he received, and how much remains after deducting the payment?

Ans. He received 29860 dls. and there remains 13345 dls.

6. What is the product of 15927 multiplied by 4009? Ans. 63851343.

7. 128 men have one half of a prize, worth 34560 dollars, to be equally divided between them: what is each man's part? Ans. 135 dollars. Prove this answer to be right.

8. Three merchants, A, B and C, have a stock of 14876 dollars, of which A put in 4963 dols. B 5188 dols. and C the remainder: how much did C put in? Ans. 4715 dols.

TABLE

OF

MONEY, WEIGHTS, MEASURES, &c.

FEDERAL MONEY.

10 Mills	make	1 Cent.
10 Cents		1 Dime.
10 Dimes, or 100 Cents		1 Dollar.
10 Dollars		1 Eagle.

English Money.

4 Farthings	make	1 Penny.	
12 Pence		1 Shilling.	
20 Shillings		1 Pound.	

Pence Table.

d		*s*	*d*
20	are	1	8
30	- -	2	6
40	- -	3	4
50	- -	4	2
60	- -	5	0
70	- -	5	10
80	- -	6	8
90	- -	7	6
100	- -	8	4
110	- -	9	2
120	- -	10	0
130	- -	10	10
140	- -	11	8
150	- -	12	6
200	- -	16	8

Shillings Table.

s		£	*s*
20	are	1	0
30	- -	1	10
40	- -	2	0
50	- -	2	10
60	- -	3	0
70	- -	3	10
80	- -	4	0
90	- -	4	10
100	- -	5	0
110	- -	5	10
120	- -	6	0
130	- -	6	10
140	- -	7	0
150	- -	7	10
200	- -	10	0

Troy Weight.

24 Grains	make	1 Pennyweight.
20 Pennyweights		1 Ounce.
12 Ounces		1 Pound.

Note. By this weight are weighed jewels, gold, silver, and liquors.

Avoirdupois Weight.

16 Drams	make	1 Ounce.
16 Ounces		1 Pound.
28 Pounds		1 Quarter.
4 Quarters		1 Hundred.
20 Hundred weight		1 Tun.

Note. By this weight are weighed such commodities as are coarse and subject to waste, and all metals, except gold and silver. One pound Avoirdupois is equal to 14 oz. 11 dwt. and 15½ grs. Troy.

Apothecaries' Weight.

20 Grains	make	1	Scruple.
3 Scruples		1	Dram.
8 Drams		1	Ounce.
12 Ounces		1	Pound.

Note. Apothecaries use this weight in compounding their medicines; but they buy and sell their drugs by Avoirdupois weight.

Cloth Measure.

4 Nails	make	1	Quarter.
4 Quarters		1	Yard.
3 Quarters		1	Ell Flemish.
5 Quarters		1	Ell English.
6 Quarters		1	Ell French.

Long Measure.

3 Barley Corns	make	1	Inch.
12 Inches		1	Foot.
3 Feet		1	Yard.
5½ Yards, or 16½ Feet		1	Pole, Rod or Perch.
40 Poles, or 220 yards		1	Furlong.
8 Furlongs		1	Mile.
3 Miles		1	League.
60 Geographical, or 69½ Statute Miles		1	Degree.

Note. In this measure, length only is considered.

Land or Square Measure.

144 Square Inches	make	1	Square Foot.
9 Feet		1	Yard.
30¼ Yards, or 272¼ Feet		1	Pole, Rod or Perch.
40 Poles or Perches		1	Rood.
4 Roods		1	Acre.

Note. This measure respects length and breadth.

Wine Measure.

2 Pints	make	1	Quart.
4 Quarts		1	Gallon.
42 Gallons		1	Tierce.
63 Gallons		1	Hogshead.
84 Gallons		1	Puncheon.
2 Hogsheads		1	Pipe or Butt.
2 Pipes or 4 Hogsheads		1	Tun.

Note. The wine gallon contains 231 cubic inches.

Ale and Beer Measure.

2	Pints	make	1 Quart.
4	Quarts		1 Gallon.
8	Gallons		1 Firkin of Ale.
9	Gallons		1 Firkin of Beer.
2	Firkins		1 Kilderkin.
2	Kilderkins		1 Barrel.
54	Gallons		1 Hhd. of Beer.
3	Barrels		1 Butt.

Note. The ale gallon contains 282 cubic inches.

Cubic or Solid Measure.

1728	Inches	make	1 Foot.
27	Feet		1 Yard.
40 Feet of round Timber, or 50 Feet of hewn Timber			1 Ton or Load.
128	Solid Feet		1 Cord of Wood.

Note. 8 feet in length, 4 in breadth, and 4 in height, making 128 solid feet, contain a cord of wood. This measure respects length, breadth and thickness.

Dry Measure.

2	Pints	make	1 Quart.
2	Quarts		1 Pottle.
2	Pottles		1 Gallon.
2	Gallons		1 Peck.
4	Pecks		1 Bushel.
2	Bushels		1 Strike.
4	Bushels		1 Coom.
8	Bushels		1 Quarter.
36	Bushels		1 Chaldron.
5	Quarters		1 Wey.
2	Weys		1 Last.

Note. The gallon dry measure contains 268$\frac{4}{5}$ cubic inches.

Time.

60	Seconds	make	1 Minute.
60	Minutes		1 Hour.
24	Hours		1 Day.
365	Days		1 Year.

Note. 365 days, 5 hours, 48 minutes, 57 seconds, make a solar year, according to the most exact observation.

The number of days in each month is thus found:

Thirty days hath September,
April, June, and November;
February hath *twenty-eight* alone,
And all the rest have *thirty-one*.

When the year can be divided by 4 without a remainder, it is Bissextile or Leap Year, in which February hath 29 days.

COMPOUND ADDITION

Teacheth to collect numbers of different denominations into one total.

FEDERAL MONEY.

dls.	cts.	m.	dls.	cts.	m.
174	74	3	396	14	4
198	19	3	147	19	5
157	14	4	149	57	9
196	76	9	157	83	8

ENGLISH MONEY.

£.	s.	d.	£.	s.	d.
149	14	$6\frac{2}{4}$	814	16	$6\frac{1}{2}$
387	19	$8\frac{1}{2}$	198	18	$8\frac{2}{4}$
259	16	$7\frac{1}{4}$	376	14	$9\frac{1}{2}$
874	17	$4\frac{3}{4}$	226	16	$7\frac{3}{4}$
678	15	$6\frac{1}{2}$	174	17	$10\frac{1}{2}$

TROY WEIGHT.

lb.	oz.	dwt.	gr.	lb.	oz.	dwt.	gr.
48	7	14	19	83	11	15	22
95	4	17	22	15	6	16	19
27	5	14	15	21	8	19	23
65	6	19	16	33	9	15	14
19	7	13	15	46	4	13	17

Avoirdupois Weight.

ton.	cwt.	qr.	lb.	oz.	dr.		cwt.	qr.	lb.
18	17	1	14	13	13		593	1	19
36	15	3	16	13	15		187	3	19
29	15	2	19	12	13		159	2	25
14	16	3	27	14	12		283	3	13
16	19	2	25	13	10		146	2	18
57	17	1	14	15	9		259	1	22

Apothecaries' Weight.

lb.	oz.	dr.	sc.	gr.		lb.	oz.	dr.	sc.	gr.
3	7	5	1	17		2	5	3	2	11
1	3	2	2	13		1	2	2	1	14
2	5	3	2	14		3	3	5	2	13
3	4	2	1	15		5	5	4	1	12
5	2	2	2	17		2	9	3	2	15
2	3	1	2	18		1	6	4	2	17

Cloth Measure.

yd.	qr.	nl.	E.Fl.	qr.	nl.	E.Fr.	qr.	nl.	E.E.	qr.	nl.
571	1	3	873	2	3	181	2	2	56	1	2
184	2	2	196	2	2	196	3	3	19	2	3
196	2	3	158	1	1	157	4	2	14	3	2
283	3	2	147	2	3	168	3	3	26	4	3
146	2	3	326	2	2	193	5	2	83	2	2
375	3	2	194	2	1	214	2	3	57	3	3

Wine Measure.

ton.	hhd.	gal.	qt.	pt.		ton.	hhd.	gal.	qt.	pt.
187	1	17	3	1		176	3	16	2	1
56	3	15	2	1		59	2	57	3	1
9	1	29	3	1		8	3	14	2	1
36	2	18	2	1		17	2	19	1	1
217	3	57	1	1		168	1	38	2	1
56	1	46	2	1		25	2	52	3	1

Ale and Beer Measure.

hhd.	gal.	qt.	pt.
49	38	2	1
38	45	3	1
57	48	2	1
49	37	1	1
57	26	2	1
28	18	3	1

hhd.	gal.	qt.	pt.
78	17	3	1
19	16	2	1
15	51	3	1
76	43	2	1
23	26	3	1
52	38	2	1

Dry Measure.

qr.	bush.	pck.	qt.
57	4	2	1
19	5	3	1
38	6	2	3
27	7	3	7
5	3	1	4
9	2	2	3
72	5	3	2

chal.	bush.	pck.	qt.
576	31	1	3
19	27	2	2
58	15	3	5
25	8	2	4
9	9	1	6
14	15	2	3
32	26	3	2

Long Measure.

deg.	mil.	fur.	po.	ft.	in.bar.
217	17	7	19	14	9 1
733	17	4	16	13	3 2
283	53	5	19	12	2 2
346	26	6	23	13	4 1
189	32	3	27	14	5 2
176	14	2	15	15	6 2
921	15	4	18	16	7 1

mil.	fur.	po.	yd.	ft.
876	7	13	4	2
129	6	26	2	1
167	4	19	3	2
157	3	15	2	2
286	2	27	1	1
194	5	32	2	2
176	4	18	5	2

Land Measure.

acr.	roo.	per.
741	1	19
69	3	29
15	2	16
37	3	14
16	2	13
29	3	27

acr.	roo.	per.
870	3	19
19	2	16
54	3	37
129	2	26
187	3	14
136	2	19

TIME.

yrs.	*days.*	*hrs.*	*min.*	*sec.*	*yrs.*	*days.*	*hrs.*	*min.*	*sec.*
187	149	14	13	12	300	169	14	16	17
146	126	16	16	16	19	186	17	16	16
59	186	19	39	19	46	147	15	19	19
28	140	21	46	35	87	196	23	46	47
7	119	22	18	26	157	219	14	23	16
146	146	19	57	19	46	138	15	42	13

COMPOUND SUBTRACTION

Teacheth to find the inequality between numbers of divers denominations.

FEDERAL MONEY.

	dol.	*ct.*	*m.*	*dol.*	*ct.*	*m.*	*dol.*	*ct.*	*m.*
From	1901	95	1	435	00	1	170	10	3
Take	992	97	2	9	15	9	9	50	2

ENGLISH MONEY.

	£.	*s.*	*d.*	£.	*s.*	*d.*
From	191	11	$3\frac{1}{2}$	304	19	$8\frac{1}{4}$
Take	114	16	$2\frac{1}{4}$	126	16	$8\frac{1}{2}$
From	389	18	$0\frac{1}{4}$	100	0	5
Take	9	19	4	11	11	$2\frac{3}{4}$

TROY WEIGHT.

	lb.	*oz.*	*dwt.*	*gr.*	*lb.*	*oz.*	*dwt.*	*gr.*
From	87	11	11	13	27	10	15	22
Take	19	11	14	22	15	9	16	23

Avoirdupois Weight.

	ton.	*cwt.*	*qr.*	*lb.*	*oz.*	*dr.*	*cwt.*	*qr.*	*lb.*
From	100	10	1	11	14	13	59	1	11
Take	15	13	1	18	12	15	19	3	27

Apothecaries Weight.

	lb.	*oz.*	*dr.*	*sc.*	*gr.*	*lb.*	*oz.*	*dr.*	*sc.*	*gr.*
From	2	3	4	1	13	2	1	3	1	15
Take	1	7	5	2	10	1	4	2	2	17

Cloth Measure.

	yd.	*qr.*	*nl.*	*E.Fl.*	*qr.*	*nl.*	*E.E.*	*qr.*	*nl.*	*E.Fr.*	*qr.*	*nl.*
From	251	1	2	189	2	1	419	1	3	389	2	2
Take	127	3	3	120	2	2	174	3	2	189	5	3

Wine Measure.

	tun.	*hhd.*	*gal.*	*qt.*	*pt.*	*tun.*	*hhd.*	*gal.*	*qt.*	*pt.*
From	591	1	13	1	1	800	1	50	2	1
Take	126	2	56	3	1	149	2	61	3	1

Ale and Beer Measure.

	khd.	*gal.*	*qt.*	*pt.*	*hhd.*	*gal.*	*qt.*	*pt.*
From	571	19	3	1	100	36	2	1
Take	198	53	2	1	9	27	3	1

Dry Measure.

	qr.	*bu.*	*gal.*	*qt.*	*chal.*	*bu.*	*gal.*	*qt.*
From	38	4	5	3	69	21	3	2
Take	17	5	1	2	49	33	5	3

Long Measure.

	deg.	*m.*	*fur.*	*p.*	*f.*	*in.*	*b.*	*m.*	*fur.*	*p.*	*f.*
From	819	13	1	19	11	3	1	219	3	14	11
Take	159	49	2	27	16	8	2	209	7	15	12

LAND MEASURE.

	acr.	roo.	per.		acr.	roo.	per.		acr.	roo.	per.
From	591	1	11		501	3	13		219	2	21
Take	129	3	15		190	2	21		156	1	36

TIME.

	yrs.	da.	hr.	m.	sec.		yrs.	da.	hr.	m.	sec.
From	171	143	11	14	19		811	111	15	23	52
Take	128	174	19	51	14		389	190	21	48	54

PRACTICAL QUESTIONS IN COMPOUND ADDITION AND SUBTRACTION.

1. Cast up the following sums, viz. twenty-three shillings and five pence, one pound and nine pence, seven shillings and eleven pence three farthings, twenty pounds thirteen shillings and nine pence, fifteen pence three farthings.

	£	s.	d.
	1	3	5
	1	0	9
	0	7	$11\frac{3}{4}$
	20	13	9
	0	1	$3\frac{3}{4}$
Ans.	£. 23	7	$2\frac{1}{2}$
Proof.	£. 23	7	$2\frac{1}{2}$

2. Twenty dollars and four cents, five dollars and three mills, eighty-two cents, six dollars and five mills.

Ans. 31 dols. 86 cts. 8 m.

3. Seventy dollars, three dollars and three cents, thirty-four cents and four mills, eighty dollars and a half, six dollars and a quarter. Ans. 160 dols. 12 cts. 4 m.

4. Ten pounds and three pence, forty-five shillings and ten-pence half penny, thirty-seven shillings and four-pence three farthings, nine pounds and three farthings, one shilling *and six-pence farthing*, eighty-two shillings and four pence *half penny*. Ans. £.27 7 $5\frac{1}{4}$

5. Thirty dollars six cents and a half, fifty three cents and three quarters, eleven cents and a quarter, nine dollars eleven cents and a half, fifty four cents. Ans. 40 dols. 37 cts.

6. Take three shillings and four pence from one pound two shillings and a penny. Ans. 18*s.* 9*d.*

7. From £.5 2*s.* 1*d.* take nine shillings and six-pence half-penny. Ans. £.4 12 6¼

8. Take twenty shillings and three farthings from £.8 Ans. £.6 19 11¼

9. From 18 dollars take eight mills. Ans. 17 dols. 99 cts. 2 m.

10. Take 53 dimes from 53 eagles. Ans. 524 dols. 7 dimes or 70 cts.

11. A merchant bought 112 bars of iron, weighing 56 cwt. 1 qr. 11 lb. of which he sold 59 bars, weighing 29 cwt. 3 qrs. 21 lb.: how many bars has he remaining, and what is the weight? Ans. 53 bars, weighing 26 cwt. 1 qr. 18 lb.

12. Required the total weight of 4 hogsheads of sugar, weighing as follows, viz. No. 1, 9 cwt. 2 qrs. 21 lb. No. 2, 10 cwt. 3 qrs. 23 lb. No. 3, 8 cwt. 2 qrs. 25 lb. No. 4, 9 cwt. 3 qrs. 17 lb. Ans. 39 cwt. 1 qr. 2 lb.

13. A ropemaker received 3 tons 15 cwt. 3 qrs. 14 lb. of hemp to be wrought, of which he delivered in cordage 34 cwt. 1 qr. 22 lb.: how much remains? Ans. 2 tons 1 cwt. 1 qr. 20 lb.

14. Received 57953 mills, 4953 cents, 1913 dimes, and 45 eagles: required the total sum? Ans. 748 dols. 78 cts. 3 mills.

15. A cashier received, viz. one hundred pounds and nine pence half-penny, three thousand seven hundred and four pounds ten shillings, twenty thousand and ninety pounds two shillings and eleven pence three farthings, of which he paid away sixteen thousand sixteen hundred and sixteen pounds: how much has he on hand? Ans. £.6278 13 9¼

16. A farmer bought three pieces of land, measuring, viz. the first piece 21 acres 3 roods 19 poles; the second, 37 acres 2 roods 29 poles; the third, 27 acres 2 roods 25 poles; of which he sells 15 acres 2 roods 39 poles: how much has he remaining? Ans. 71 acres 1 rood 34 poles.

17. A has paid B £.9 15 6¼, £.19 11 9¾, £.14 19 7½, and 54*s.* 3¼*d.* on account of a debt of £.50: how much is there still unpaid? Ans. £.2 18 9¼

REDUCTION

Teacheth to change numbers from one denomination to another, without losing their value.

RULE. When the Reduction is descending, multiply the highest denomination by as many of the next less as make one of the greater, adding to the product the parts of the same name, and so on to the last.

When the Reduction is ascending, divide the given number by as many of that denomination as make one of the next higher, and so on to the denomination required, and the last quotient with the several remainders (if any) will be the answer.

The proof is by reversing the question.

FEDERAL MONEY.

1. In 53 dollars how many mills?

53 dolls.
10
530 dimes.
10
5300 cents.
10
Ans. 53000 mills.

Or decimally, by adding a cypher for each inferior denomination, thus,

dl d c m
53,000

2. In 14000 mills how many dollars?

10)14000
10)1400
10)140
Ans. 14 dols.

Or decimally, by separating the figures—counting from the right to the name required, thus,

dl d c m
14,000

3. In 57935 mills how many dollars?

Ans. 57 dolls. 93 cents, 5 mills.

4. How many eagles in 1933 dimes?

Ans. 19 eagles, 3 dollars, 3 dimes.

5. In 1290 mills how many dimes?

Ans. 12 dimes, 9 cents.

6. How many cents in 46 dollars? Ans. 4600.

7. In 190004 mills how many dollars?

Ans. 190 dollars, 4 mills.

English Money.

1. In £.91 11 3½ how many farthings?

		Proof.
20		4)87902
1831 shillings.		
12		12)21975—2
21975 pence.		20)1831—3
4		£.91 11 3½

Ans. 87902 farthings.

2. How many pounds in 3175 farthings? Ans. £.3 6 1¾
3. In 19*s.* 8¾*d.* how many farthings? Ans. 947 farth.
4. How many pounds in 9752 pence? Ans. £.40 12 8
5. In £.46 how many crowns of 6*s.* 7*d.* each?
 Ans. 139 crowns and 4 shillings and 11 pence.
6. How many pounds in 493 dollars? Ans. £.147 18
7. In 143 pence, how many shillings? Ans. 11*s.* 11*d.*
8. Reduce 38*s.* 4½*d.* to half pence. Ans. 921 half pence.

Prove the above answers to be right.

Troy Weight.

1. In 15lb. Troy how many grains? Ans. 86400 grs.
2. How many ounces in 5749 dwt.? Ans. 287 oz. 9 dwt.
3. In 11 oz. 13 dwt. 13 grs. how many grains?
 Ans. 5605 grs.
4. How many grains in 15 spoons, each weighing 6 dwt. 15 grains? Ans. 2385 grains?

Avoirdupois Weight.

1. In 19 tons 14 cwt. 2 qrs. 19 lb. 11 oz. 13 drs. how many drams? Ans. 11316157 drs.
2. How many cwt. in 9563 lbs.?
 Ans. 85 cwt. 1 qr. 15 lb.
3. In 13 cwt. 3 qrs. 21 lb. how many pounds?
 Ans. 1561 lb.
4. How many mess-pieces of 4½ lb. and 3½ lb. of each an equal number, in 31 cwt. 1 qr. 12 lb. of beef?
 Ans. 439 pieces of each.

Wine Measure.

1. In 25 tons of wine how many pints?
 Ans. 50400 pints.

2. How many hogsheads in 4935 quarts?
Ans. 19 hhd. 36 galls. 3 qt.
3. In 3 hhds. 13 galls. 2 qts. how many half pints?
Ans. 3240 half pints.

Cloth Measure.

1. In 158 yards how many nails? Ans. 2528 nails.
2. How many ells English in 5932 nails?
Ans. 296 ells 3 qrs.
3. In 29 pieces of holland, each containing 36 ells Flemish, how many yards? Ans 783 yards.

Long Measure.

1. In 29 miles how many inches? Ans. 1837440 inches.
2. How many furlongs in 19753 yards?
Ans. 89 fur. 173 yards.
3. In 590057 inches how many leagues?
Ans. 3 leag. 2 fur. 110 yds. 1 ft. 5 in.

Time.

1. How many hours in 57 years, allowing each year to be 365 days 6 hours? Ans. 499662 hours.
2. In 57953 hours how many weeks?
Ans. 344 weeks, 6 days, 17 hours.
3. How many days from 19th of March to the 23d of September following? Ans. 188 days.
4. How many days from the 24th of May, 1797, to the 15th of December, 1798? Ans. 570 days.

Land Measure.

1. In 41 acres 2 roods 14 perches, how many rods?
Ans. 6654 rods or perches.
2. How many square rods in 7752 square feet?
Ans. 28 rods 129 feet.
3. In 5972 perches, how many acres?
Ans. 37 acres, 1 rood, 12 perches.

Solid Measure.

1. In a pile of wood 96 feet long, 5 feet high, and 4 feet wide, how many cords? Ans. 15 cords.
2. In 82 tons of round timber how many inches?
Ans. 5667840 inches.
3. What are the contents of a load of wood, 6 feet long, 4 feet high, and $2\frac{1}{2}$ feet wide? Ans. $3\frac{3}{4}$ feet.

GRINDSTONES are sold by the cubic foot, commonly called a stone, and the contents are thus found:

RULE. To the whole diameter add half of the diameter, and multiply the sum of these by the same half, and this product by the thickness; divide this last number by 1728, the inches in a cubic foot, and the quotient is the contents or answer required.

EXAMPLES.

4. How many cubic feet in a grindstone, 24 inches diameter, and 4 inches thick?

24 diameter.
12 half diameter.

36
12

432
4 thickness.

1728)1728

Ans. 1 foot.

5. What are the contents of a grindstone, 36 inches diameter, and 4 inches thick?

36
18

54
18

432
54

972
4

1728)3888($2\frac{1}{4}$
3456

432
4

1728)1728(1
1728

Ans. $2\frac{1}{4}$ cubic feet.

AMERICAN MONEYS.

To change New-England and Virginia currency to Federal money, the dollar being 6 shillings.

RULE. As the value of a dollar is equal to three-tenths of a pound, when pounds are given to be changed, annex three cyphers to the sum, and divide the whole by 3; the quotient is the answer in cents.

EXAMPLES.

1. Change £.523 to Federal money.

3)523000

174333⅓ cents. Ans. 1743 dols. 33⅓ cts.

Change the following sums, viz.

	£.					dols.	cts.
2.	184	-	-	-	Ans.	613	33⅓
3.	29	-	-	-	-	96	66⅔
4.	57	-	-	-	-	190	
5.	219	-	-	-	-	730	
6.	81	-	-	-	-	270	
7.	127	-	-	-	-	423	33⅓

When pounds and shillings are given, to the pounds annex half the number of shillings and two cyphers, if the number of shillings in the given sum be even; but if the number be odd, annex half the number, and then 5 and one cypher, and divide by 3; the quotient is the answer in cents.

EXAMPLES.

1. Change £.59 18*s.* to Federal money.

3)59900

19966⅔ cts. Ans. 199 dls. 66⅔ cts.

2. Change £.93 13*s* to Federal money.

3)93650

31216⅔ cts. Ans. 312 dls. 16⅔ cts.

Change the following sums, viz.

	£.	*s.*					dls.	cts.
3.	129	13	-	-	-	Ans.	432	16⅔
4.	63	15	-	-	-	-	212	50
5.	27	18	-	-	-	-	93	
6.	182	19	-	-	-	-	609	83⅓
7.	57	16	-	-	-	-	192	66⅔
8.	121	7	-	-	-	-	404	50

When there are shillings, pence, &c. in the given sum, annex for the shillings as before directed, and to these add the farthings in the given pence and farthings, observing to increase their number by one when they exceed 12, and by two when they exceed 37, and divide as before.

EXAMPLES.

1. Change £.21 8*s*. 4¼*d*. to Federal money.

3)21419

7139¾ cts.

4 is annexed to the pounds for half the shillings, and 19 for the farthings in 4¼*d*. and excess of 12.

Ans. 71 dols. 39¾ cts.

2. Change £.117 16*s*. 2*d*. to Federal money.

3)117808

39269⅓ cts. Ans. 392 dls. 69⅓ cts.

3. Change £.721 9*s*. 11¼*d*. to Federal money.

3)721497

240499 cts.

In this example 4 is annexed to the pounds for half the even shillings, and 47 for the farthings in 11¼*d*. and excess of 37, and then 5 is added to the figure next to half the shillings, making it 9 in place of 4 for the odd shilling.

Ans. 2404 dols. 99 cts.

4. Change £.29 11*s*. 2½*d*. to Federal money.

3)29559

9853 cts. Ans. 98 dols. 53 cts.

Change the following sums, viz.

5.	25	19	9	-	-	-	Ans.	86	62½
6.	24	11	7¾	-	-	-	-	81	94
7.	1238	10	9½	-	-	-	-	4128	46¾
8.	2001	1	3¼	-	-	-	-	6670	21¾
9.	153	17	6	-	-	-	-	512	91¾

A TABLE

For changing Shillings and Pence into Cents and Mills.

	shill. 0	*shill.* 1	*shill.* 2	*shill.* 3	*shill.* 4	*shill.* 5
pence.	*cts. m.*	*cts. m.*	*cts. m.*	*cts. m.*	*cts. m.*	*cts. m.*
0		16 7	33 3	50 0	66 7	83 3
1	1 4	18 1	34 7	51 4	68 1	84 7
2	2 8	19 5	36 1	52 8	69 5	86 1
3	4 2	20 9	37 5	54 2	70 9	87 5
4	5 6	22 3	38 9	55 6	72 3	88 9
5	7 0	23 7	40 3	57 0	73 7	90 3
6	8 3	25 0	41 7	58 3	75 0	91 7
7	9 7	26 4	43 0	59 7	76 4	93 0
8	11 1	27 8	44 4	61 1	77 8	94 4
9	12 5	29 2	45 8	62 5	79 2	95 8
10	13 9	30 6	47 2	63 9	80 6	97 2
11	15 3	32 0	48 6	65 3	82 0	98 6

To change Federal Money to N. England & Virginia Currency.

RULE. When the sum is dollars only, multiply it by 3, and double the first figure of the product for shillings, and the rest of the product will be pounds.

When there are cents in the given sum, multiply the whole by 3, and cut off three figures of the product to the right hand as a remainder.

Multiply this remainder by 20, and cut off as before.

Proceed in this manner through the several parts of a pound, and the numbers standing on the left hand make the answer, in the several denominations.

NOTE. If there be mills, cut off four figures, and proceed as above.

EXAMPLES.

1. Change 872 dollars to New-England currency.

872		
3		
	£	s.
261 12	Ans. 261	12

2. Change 1971 dls. 96⅔ cts. to Massachusetts currency.

1971 96⅔
3

£.591,590
20

s.11,800
12

d. 9,600
4

f. 2,400

Ans. £.591 11 9½

3. Reduce 1259 dls. 89 cts. and 7 ms. to Mass. currency.

1259 89 7
3

£.377,9691
20

s.19,3820
12

d. 4,5840
4

f. 2,3360

Ans. £.377 19 4½

A TABLE

For changing Cents into Shillings, Pence and Farthings.

		cts. 10		cts. 20		cts. 30		cts. 40		cts. 50		cts. 60		cts. 70		cts. 80		cts. 90	
cts.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
0			7¼	1	2½	1	9¾	2	4¾	3	0	3	7¼	4	2½	4	9¾	5	4¾
1	¾		8	1	3	1	10¼	2	5½	3	0¾	3	8	4	3	4	10¼	5	5½
2	1½		8¾	1	3¾	1	11	2	6¼	3	1½	3	8¾	4	3¾	4	11	5	6¼
3	2¼		9¼	1	4½	1	11¾	2	7	3	2¼	3	9¼	4	4½	4	11¾	5	7
4	2¾		10	1	5¼	2	0½	2	7¾	3	2¾	3	10	4	5¼	5	0½	5	7¾
5	3½		10¾	1	6	2	1¼	2	8½	3	3½	3	10¾	4	6	5	1¼	5	8½
6	4¼		11½	1	6¾	2	2	2	9	3	4¼	3	11½	4	6¾	5	2	5	9
7	5		1 0¼	1	7½	2	2¾	2	9¾	3	5	4	0¼	4	7½	5	2¾	5	9¾
8	5¾		1 1	1	8	2	3¼	2	10½	3	5¾	4	1	4	8	5	3¼	5	10½
9	6½		1 1¾	1	8¾	2	4	2	11¼	3	6½	4	1¾	4	8¾	5	4	5	11¼

To change New-York and North-Carolina currency to Federal money, the dollar being eight shillings.

RULE. Prepare the given sum by the rule for New-England money, and divide by 4: the quotient is the answer in cents.

EXAMPLES.

1. Change £.461 to Federal money.

4)461000

115250 cts. Ans. 1152 dols. 50 cts.

2. Change £.419 10*s.* 8½*d.* to Federal money.

4)419535

104883¾ cts. Ans. 1048 dols. 83¾ cts.

To change Federal money to New-York and North-Carolina currency.

RULE. As for Massachusetts currency, using 4 as a multiplier instead of 3; the value of a dollar being equal to four tenths of a pound.

EXAMPLES.

1. Change 1684 dollars to New-York and North-Carolina currency.

1684
4

Ans. £.673 12

2. Change 1048 dols. 83¾ cents to New-York currency.

1048,83¾
4

419,535
20

10,700
12

8,400
4

1,600 Ans. £.419 10*s.* 8½*d.*

To change New-Jersey, Pennsylvania, Delaware and Maryland currency to Federal money, the dollar being 7s. 6d.

RULE. As the value of a dollar is equal to ⅔ of a pound, multiply the given sum, when it is pounds only, by 8, and divide by 3, for dollars. If there be shillings, &c. increase the sum in pence by ⅓ of the whole sum for cents.

EXAMPLES.

1. Change £.471 to Federal money.

471
8

3)3768

Ans. 1256 dollars.

2. Change £.480 19*s*. 9*d*. to Federal money.

480 19 9
20

9619
12

9)115437
12826⅓

128263⅓ cents. Ans. 1282 dols. 63⅓ cts.

To change Federal money to New-Jersey, Pennsylvania, Delaware and Maryland currency,

RULE. Multiply the sum, when in dollars, by 3, and divide by 8, for pounds. If there be dollars and cents, multiply the given sum by 90, and the product (rejecting two figures on the right) is pence; or deducting $\frac{1}{10}$ of the sum, gives the pence likewise.

EXAMPLES.

1. Change 1256 dollars to Pennsylvania currency.

1256
3

8)3768

Ans. £.471

2. Change 1282 dols. 63⅓ cts. to Pennsylvania currency.

128263⅓	Or $\frac{1}{10}$)128263⅓
90	12826⅓
12)115437,00	12)115437
20)9619—9	20)9619—9
Ans. £.480 19 9	£.480 19 9 as before.

To change South-Carolina and Georgia currency to Federal money, the dollar being 4s. 8d.

RULE. As the value of a dollar is equal to $\frac{7}{30}$ of a pound if the sum be pounds only, multiply it by 30, and divide by 7, for dollars. If there be shillings, &c. annex two cyphers to the pence in the given sum, and divide by 56, the pence in a dollar, *the quotient* is the answer in cents.

EXAMPLES.

1. Change £.28 to Federal money.

28
30

7)840

120 Ans. 120 dols.

2. Change £.11 4 8 to Federal money.

11 4 8
20

224
12

8×7=56 8)269600

7)33700

4814⅞ cts. Ans. 48 dols. 14⅞ cts.

To change Federal money to South-Carolina and Georgia currency.

RULE. Multiply the dollars by 7, and divide by 30, for pounds. If there be dollars and cents, multiply by 56, and the product (rejecting two figures on the right) is the answer in pence.

EXAMPLES.

1. Change 540 dols. to S. Carolina and Georgia currency.

540
7

3|0)378|0

Ans. £. 126

2. Change 48 dols. 14⅞ cts. to South-Carolina currency.

48 14⅞
56

28884
24070
16

12)2696,00

20)224—8

11 4 8

56
2

7)112
16

Ans. £.11 4 8

To change Canada and Nova-Scotia currency to Federal mone the dollar being 5 shillings.

RULE. As the value of a dollar is equal to one fourth a pound, multiply the sum, when in pounds, by 4, for dolla

When there are shillings, &c. reduce the given sum pence, annex two cyphers, and divide by 60, for cents.

EXAMPLES.

1. Change £.36 Canada currency to Federal money.

36
4

Ans. 144 dolls.

2. Change £.528 12*s.* 6*d.* Canada currency to Feder money.

20

10572
12

6|0)1268700|0

211450 cts.

Or thus,

528
4

2112

10 shill.= 2
2*s.* 6*d.* = 0 50

2114 50

Ans. 2114 dls. 50 cts.

To change Federal money to Canada and Nova-Scotia currenc

RULE. Divide the sum in dollars by 4 for pounds.

If there be dollars and cents, multiply the given sum l 60, and the product (rejecting two figures on the right) the answer in pence.

EXAMPLES.

1. Change 144 dollars to Canada currency.

4)144

Ans. £.36

2. Change 2114 dols. 50 cts. to Canada or Nova-Scot currency.

211450
60

12)126870|00

2|0)1057|2—6

528 12 6 Ans. £.528 12*s.* 6*d.*

COMPOUND MULTIPLICATION

Is the multiplying of numbers of different denominations by a simple figure or figures, whose product shall be equal to a proposed number.

I. When the quantity does not exceed 12, multiply the price by the quantity, and the product will be the answer.

Multiply	£.				£.			
	191	17	8½		913	11	9¾	
by			2				5	
Ans.	£.383	15	5		£.4567	19	0¾	
	£.980	19	11¼		£.209	18	4½	
			12				9	

1. What will 7 yards of shalloon come to at 3*s.* 5*d.* per yard?

	s.	*d.*
	3	5
		7
£.1	3	11

		s.	*d.*	£.	*s.*	*d.*
2.	4 lb. tea, - -	6	8	1	6	8
3.	5 bushels rye, -	5	9	1	8	9
4.	6 gallons wine, -	7	5	2	4	6
5.	7 quintals fish, -	19	6	6	16	6
6.	9 cwt. iron, -	29	10	13	8	6
7.	11 gallons brandy,	8	5	4	12	7
8.	12 quintals fish, -	22	10	13	14	0

II. If the number or quantity exceeds 12, and is to be found in the table, multiply by its component parts.

EXAMPLES.

	s.	*d.*
1. 14 yards durant at	2	5
		2
	4	10
		7
Ans. £.1	13	10

			s.	d.			£.	s.	d.
2.	16 yards silk	at	4	9	-	-	3	16	0
3.	20 lb. coffee	-	1	9½	-	-	1	15	10
4.	28 gallons rum	-	6	5¾	-	-	9	1	5
5.	45 cwt. iron	-	29	6	-	-	66	7	6
6.	56 yards broadcloth		28	7	-	-	80	0	8
7.	63 pair shoes,	-	9	3	-	-	29	2	9
8.	84 quintals fish,	-	18	6	-	-	77	14	0
9.	100 galls. molasses,		3	5½	-	-	17	5	10
10.	121 bushels corn	-	4	3	-	-	25	14	3
11.	144 gallons brandy,		5	7¾	-	-	40	13	0

To multiply by fractional parts, as ½, ¾, ⅞, *&c.*

RULE. Multiply the price by the upper figure of the fraction, and divide the product by the lower, the quotient will be the answer; but when the upper figure is not more than one, dividing the price or sum by the lower figure gives the answer.

EXAMPLES.

1. What is ¾ of a yard of cambric worth, at 12*s*. 6*d*. per yard?

12 6
3

8)37 6

Ans. 4*s*. 8½*d*.

2. What is ¾ of a yard of broadcloth worth, at 35*s*. per yard?

35
3

4)105

Ans. 26*s*. 3*d*.

Or thus, 2)35

2)17 6 price of half a yard.

8 9 price of a quarter.

26 3

3. One quarter of a yard of fine linen, at 7*s*. 6*d*. per yard.

4)7 6

1 10½ Ans. 1*s*. 10½*d*.

4. Multiply £.4 5*s*. 3*d*. by ⅓ or take ⅓ of it.

3)4 5 3

Ans. £.1 8 5

5. Multiply £.9 6*s*. 8*d*. by $\frac{7}{8}$, or take $\frac{7}{8}$ of it.

	9	6	8
			7
8)65	6	8	
Ans. £.8	3	4	

III. When the number does not exceed the table, and it cannot be found in it, find the nearest to it, either less or greater; then, after having found the price of this number, add or subtract the value of so many, as it is less or greater than the given number.

EXAMPLES.

1. 37 bushels of corn, at 4*s*. 11*d*. per bushel.

	4	11	
		6	
1	9	6	
		6	
8	17	0	price of 36 bushels.
	4	11	price of 1 bushel.
Ans. £.9	1	11	price of 37 bushels.

		s.	*d*.		£.	*s*.	*d*.
2.	17¼ yards shalloon, at	2	8	Ans.	2	6	0
3.	23¾ lb. coffee,	1	10½		2	4	6¼
4.	57½ gallons rum,	4	2½		12	1	11¾
5.	87⅝ yards baize,	2	1		9	2	9¾
6.	109 quintals fish,	14	6		79	0	6
7.	137¼ gallons molasses,	3	8¼		25	6	1¼

IV. When the number is above the table, find the price of each figure as in the following:

EXAMPLES.

1. 178 yards of muslin at 4*s.* 5*d.* per yard.

	4	5	
		10	
2	4	2	
		10	
22	1	8	price of 100 yards.
15	9	2	price of 70
1	15	4	price of 8
Ans. £.39	6	2	price of 178 yards.

2. 284½ gallons of molasses, at 3*s.* 9½*d.* per gallon.

	3	9½	
		10	
1	17	11	
		10	
18	19	2	
		2	
37	18	4	price of 200 gallons.
15	3	4	price of 80
	15	2	price of 4
	1	10¾	price of ½
Ans. £.53	18	8¾	price of 284½ gallons.

			s.	*d.*		£.	*s.*	*d.*
3.	183 gallons gin	at	7	5	Ans.	67	17	3
4.	345 quintals fish,	-	23	9		409	13	9
5.	769¾ lb. coffee	-	1	10		70	11	2½
6.	809½ yards baize	-	2	1½		86	0	2¼
7.	2375½ gallons of molasses		3	5½		410	15	3¼

8. Three barrels of N. E. rum, containing 31, 32½, and 33¼ gallons, at 4*s.* 7½*d.* per gallon. Ans. £.22 7 5½

9. Four hogsheads of molasses, containing 97½, 99½, 105½, and 111¾ gallons, at 3*s.* 8¾*d.* per gallon, are delivered by A to B, to whom he owed 258 dollars. It is required to know the balance, and in whose favour it is?

Ans. 4*s.* 1½*d.* in favour of B.

When the amount of a cwt. is required at a certain rate per lb.

RULE. Find the price of one or two quarters, and multiply the product by the component parts of a cwt.

1. 1 cwt. of Flour, at 3*d.* per lb.

```
        3
        7
      ----
      1 9
        8
      ----
     14 0  price of two quarters.
        2
     ----
Ans. £.1 8 0  price of one cwt.
```

Or by inverting the question thus,

```
    9 4  the price of 112 lb. at 1d. per lb.
      3
    ----
£.1 8 0  the price of 112 lb. at 3d. per lb.
```

2.	2 cwt. flour	-	-	2½*d.* per lb.	-	2	6	8
3.	3 cwt. rice	-	-	2¾ -	-	3	17	0
4.	4 cwt. iron	-	-	3¼ -	-	6	1	4
5.	5 cwt. indigo		8*s.*	11½ -	-	250	16	8

1. What will 4000 feet of boards come to at 38*s.* 4*d.* per thousand?

```
          1 18 4
            4 m.
          ------
Ans. £.7 13 4
```

2. 3596 feet of boards at 36*s.* per thousand.

```
    3596
      36
    ----
   21576
   10788
   -----
129,456s.
   -----
Ans. £.6 9 5¼
```

In this example three figures are pointed off as a remainder, and the fourth figure of the product of this remainder, multiplied by 12, is set down for pence. The fourth figure of the product of the last remainder multiplied by 4 gives the farthings.

3. 853 feet of boards at 30*s.* per thousand.

853
30

25,590*s.*

Ans. £.1 5 7

4.	3231 feet of	3 inch W. O. plank	225*s.*	£.36 6	11½
5.	8637 '	2½ '	150*s.*	64 15	6½
6.	960 '	2 '	100*s.*	4 16	0
7.	888 '	2½ pine,	100*s.*	4 8	9½

Plank are sold per thousand of 2½ inches, the usual thickness for planking vessels; and as there are generally other dimensions, as 2 and 3 inches, the price of each is regulated by the price of the 2½, adding to it, or subtracting from it, in such proportion as may be agreed on when purchasing. In the above example, taken from an actual sale, ½ of 150*s.* was added to it, for the three inch, and ½ deducted from it, for the two inch, making the three inch 225*s.* and the two inch 100*s.* per thousand.

WEIGHTS AND MEASURES.

	lb.	*oz.*	*dwt.*	*grs.*		*lb.*	*oz.*	*dwt.*	*grs.*
Multiply	14	9	14	17		825	8	19	22
by				5					8
Product	74	0	13	13		6605	11	19	8

T.	*cwt.*	*qrs.*	*lb.*		*Cwt.*	*qr.*	*lb.*	*oz.*	*drs.*
19	17	3	25		17	1	14	11	14
			9						7

T.	*hhd.*	*gal.*		*T.*	*p.*	*hhd.*	*gal.*
87	1	57		28	1	1	62
		5					7

What is the weight of 47 casks of rice, each weighing 2*C.* 1 *qr.* 23 *lb.*? Ans. 115 cwt. 1 qr. 17 lb.

BILLS OF PARCELS.

Boston, June, 28, 1804.

Mr. GEORGE ROWE *bought of* WILLIAM RUSSELL,

		s.	d.		£.		
8	pair worsted hose at	4	6	- -	1	16	0
5	do. thread do. -	3	2	- - -	0	15	10
3	yards kerseymere -	14	0	- - -	2	2	0
6	do. muslin - -	4	2	- - -	1	5	0
2	do. tammy - -	1	8	- - -	0	3	4
4	shawls - - -	7	6	- - -	1	10	0
					£.7	12	2

25 dols. 36 cts.

Portsmouth, 19*th May*, 1804.

Mr. THOMAS BARRINGTON *bought of* SIMON WILSON,

1¾	lb. tea - -	4	6	- -	£.0	7 10½
4½	bushels corn -	5	4	- -		
5	quarts brandy -	8	4 per gallon			
6	do. rum -	7	6	do. -		
7¼	yards chintz -	2	5	- -		
					£.3	11 0¾

11 dols. 84⅓ cts.

Salem, 23*d May*, 1804.

Mr. AMOS GILES *bought of* LEMUEL KING,

10	boys' coloured hats, No.	1, at	4	6	-	£.2	5 0
12	do.	2,	5	0	-		
4	do.	3,	5	6	-		
4	do.	9,	10	0	-		
4	do.	10,	11	0	-		
6	do.	11,	12	0	-		
6	men's plain black do.	12,	14	0	-		
						£.18	7 0
					Trunk	1	4 0
						£.19	11 0

65 dols. 16⅔ cts.

Boston, 10*th August*, 1803.

Mr. NATHAN PERKINS *bought of* GEORGE ALLEN,

			£.	s.	d.
64½	yds. striped nankins, at	2*s.*			
32	ells mode,	3*s.*			
28½	yds. calico,	2*s.* 4*d.*			
2	gross gilt coat buttons,	18*s.* 6*d.*			
3	pieces russel,	34*s.*			
			£.21	10	6

71 dols. 75 cts.

Newburyport, *Sept.* 10, 1803.

Mr. WILLIAM SANDS *bought of* STEPHEN NOWLAN,

			£.	s.	d.
2	pieces muslin, at	30*s.*			
25	yards Irish linen,	2*s.*			
28½	do. stormont calico,	2*s.* 6*d.*			
28½	do. red do.	2*s.* 2*d.*			
1	piece durant,	56*s.*			
2	pieces blue shalloon,	57*s.* 6*d.*			
50½	yards dimity,	2*s.* 6*d.*			
3	pieces persian,	84*s.*			
			£.39	12	3

132 dols. 4 cts.

Received payment by his note of the above date, at three months, *for Stephen Nowland*,

ABRAHAM TRUSTY.

COMPOUND DIVISION

Teacheth to find how often one number is contained in another, of different denominations.

EXAMPLES.

1. Divide £.19 14*s.* 9½*d.* by 2

2)19 14 9½

Ans. £.9 17 4¾

2. Divide £.900 11 9¾ by 3. Ans. £.300 3 11¼

Prove this answer to be right.

3. Divide £.121 7*s*. 9¾*d*. by 5 Ans. £.24 5*s*. 6¾*d*.
4. Divide £.248 9*s*. 1½*d*. by 9 Ans. £.27 12*s*. 1½*d*.
5. Divide £.1057 1*s*. 3*d*. by 12 Ans. £.88 1*s*. 9¼*d*.

II. If the divisor exceeds 12, and it be found in the table, divide by its component parts.

EXAMPLES.

1. Divide £.278 8*s*. 9*d*. between 45 men equally.

5)278 8 9
9)55 13 9
Ans. £.6 3 9 each.

2. If 20 lb. of indigo cost £.7 5*s*. 10*d*. what is it per lb.? Ans. 7*s*. 3½*d*.
3. If 24 yards of durant cost 62*s*. 6*d*. what is it per yard? Ans. 2*s*. 7½*d*.
4. If 72 bushels of corn cost £.20 9*s*. 6*d*. what is it per bushel? Ans. 5*s*. 8¼*d*.
5. If 108 lb. of tea cost £.45 13*s*. 6*d*. what is one pound worth? Ans. 8*s*. 5½*d*.
6. When £.166 13*s*. 4*d*. is paid for 500 gallons of rum, what is it per gallon? Ans. 6*s*. 8*d*.
7. If 1000 gallons of molasses cost £209 7*s*. 6*d*. what is it per gallon? Ans. 4*s*. 2¼*d*.

III. If the divisor cannot be found by the multiplication of small numbers, as in the preceding examples, divide by it as in the following

EXAMPLES.

1. Divide £.46 1*s* 11*d*. by 37.

£. *s*. *d*.
37)46 1 11(1 4 11 Ans.
37
9
20
37)181(4
148
33
12
37)407(11
37
37

2. Divide £.33 13*s.* 8½*d.* by 23. Ans. £.1 9 8½

3. If 345 quintals of fish cost £.409 13*s.* 9*d.* how much is it per quintal? Ans. 23*s.* 9*d.*

Dividing by fractional parts, as ½, ⅓, ¼, &c. is the same as multiplying by them. See the Rule under Case II, in Compound Multiplication.

1. How much is ¾ of £.91 11*s.* 3*d.*

		Or thus	
91 11 3		2)91 11 3	
3			
		2)45 15 7½	one half the sum.
4)274 13 9		22 17 9¾	one quarter.
Ans. £.68 13 5¼		£.68 13 5¼	

2. Divide £.126 19*s.* 5¾*d.* by ¼. Ans. £.101 11 7

3. If the whole of a ship is worth £.960 what is ⅝ worth? Ans. £.600

4. If ⅝ of a ship was sold for £.1056 2*s.* 1*d.* what was the whole valued at? Ans. £.1689 15 4

IV. Having the price of a hundred weight, to know how much it is per pound.

Rule. Find the price of 1 or 2 quarters, and then divide by the component parts.

1. If 1 cwt. of steel cost £.4 6*s.* 4*d.* what is it per lb.?

		Or thus	
4)4 6 4		2)4 6 4	
4)1 1 7	price of 1 qr.	7)2 3 2	price of 2 quarters.
7)0 5 4¾		8)0 6 2	
Ans. 0 0 9¼	per lb.	0 0 9¼	per lb.

2. If 1 cwt. of flour cost 23*s.* 4*d.* what is it per lb.? Ans. 2½*d.*

3. When 2 cwt. of sugar cost £.8 17*s.* 4*d.* what is it per lb.? Ans. 9½*d.*

4. If 5 cwt. of iron cost £.8 15*s.* 0*d.* how much is it per lb.? Ans. 3¾*d.*

1. A mate and 3 seamen have to receive 600 dollars, for recapturing their vessel, of which the mate is to have two shares, and each seaman one share; how much is the part of each? Ans.—The mate's part is 240 dols. and each seaman's 120.

2. Capt. M. of the Jason meets at sea with the wreck of the Hawk, of Boston, from which he takes sundry articles, which sell for 521 dollars 64 cents; two thirds of this sum are awarded to the owners of the Hawk; of the other third, the owners of the Jason are to have one half; and the remainder is to be divided between the captain, mate, and nine seamen, allowing the captain three shares, the mate two, and the seamen one share each; what are the respective parts of those concerned?

		dols.	*cts.*
Ans.—The	owners of the Hawk,	347	76
	owners of the Jason,	86	94
	captain,	18	63
	mate,	12	42
	each seaman,	6	21

DECIMAL FRACTIONS.

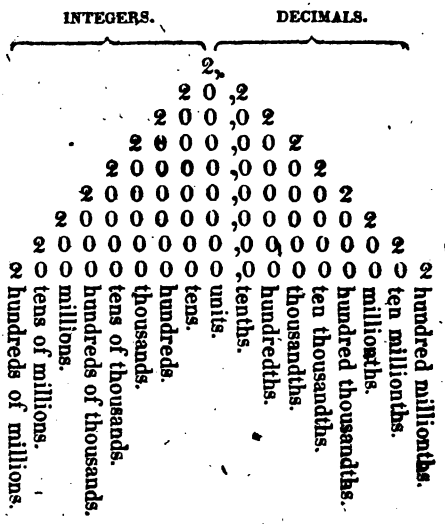
A Decimal Fraction is that, whose denominator is an unit, with as many cyphers annexed to it as the numerator has places, and is usually expressed by writing the numerator only, with a point before it, called the separatrix; thus, $\frac{5}{10}$, $\frac{25}{100}$, $\frac{125}{1000}$, are decimal fractions, and are expressed by ,5 ,25 ,125 respectively.

The figures at the left hand of the separatrix are whole numbers; thus 4,5 yards is 4 yards and 5 tenths, or one half of another yard.

Cyphers placed at the right hand of decimals make no alteration in their value; for ,5 ,50 ,500, &c. are decimals of the same value, being each equal to $\frac{1}{2}$; but when placed at the left hand, the value of the fraction is decreased in a tenfold proportion; thus ,5 ,05 ,005, &c. are 5 tenth parts, 5 hundredth parts, 5 thousandth parts, respectively.

The different value of figures will appear plainer by the following

TABLE.



From this table it apears, that as whole numbers increase in a tenfold proportion, from units to the left hand, so decimals decrease in the same proportion to the right; and that in decimals, as in whole numbers, the place of a figure determines its relative value.

ADDITION OF DECIMALS.

RULE. Place the given numbers so that the decimal points may stand directly under each other, then add as in whole numbers, and point off so many places for decimals to the right as are equal to the greatest number of the decimal places in any of the given numbers.

EXAMPLES.

263,51	42,23	2,1
149,28	18,47	,5
293,53	9,3	26,17
184,59	52,384	,7
129,4	2,1	5,
1020,31	124,484	34,47

Required the sum of twenty-nine and three tenths, three hundred and seventy-four and nine millionths, ninety-seven and two hundred and fifty-three thousandths, three hundred and fifteen and four hundreths, twenty-seven, one hundred and four tenths. Ans. 942,993009.

Required the sum of ten dollars and twenty-nine cents, ninety-three cents and three mills, nine cents and six mills, and two dollars and eight mills. Ans. 13 dols. 32 cts 7 mills.

SUBTRACTION OF DECIMALS.

Rule. Place the given numbers so that the decimal points may stand directly under each other, and then point off the decimal places as in addition.

EXAMPLES.

From	219,42	87,26	57	311
Take	184,38	19,4	9,375	11,11
	35,04	67,86	47,625	299,89

From two thousand and sixteen hundredths, take one thousand and four, and four millionths. Ans. 996,159996.

From twenty-four thousand nine hundred and nine and one tenth, take fourteen thousand and twenty-nine thousandths. Ans. 10969,071.

Take eighty-five and seven hundred and thirty-seven thousandths, from one hundred. Ans. 14,263.

From five hundred and thirty-one dollars two cents, take one hundred and seventeen dollars three cents and four mills. Ans. 413 dols. 98 cts. 6 m.

MULTIPLICATION OF DECIMALS.

Multiply exactly as in whole numbers, and from the product cut off as many figures for decimals at the right hand as there are decimals in both the factors; but if the product should not have so many, supply the defect by prefixing cyphers.

EXAMPLES.

Multiply	36,5	29,831		3,92
by	7,27	,952		196
	2555	59662		2352
	730	149155		3528
	2555	268479		392
Product	265,355	28,399112		768,32
Multiply	,285	,285	,29	124
by	,8	,003	,1	,06
Product	,2280	,000855	,029	7,44

NOTE. To multiply decimal fractions by 10, 100, 1000, &c. is only to remove the separatrix so many places towards the right as there are cyphers.

Thus, 7,362937 Multiply by $\begin{Bmatrix} 10 \\ 100 \\ 1000 \\ 10000 \end{Bmatrix}$ is $\begin{Bmatrix} 73,62937 \\ 736,2937 \\ 7362,937 \\ 73629,37 \end{Bmatrix}$

Multiply twenty-nine and three tenths by seventeen.
Ans. 498,1.

Multiply twenty-seven thousandths by four hundredths.
Ans. ,00108.

Multiply two thousand and four and two tenths by twenty seven. Ans. 54113,4.

PRACTICAL QUESTIONS.

1. How much will 93 yards of shalloon come to at 53 cts. per yard?

93	
,53	
279	
465	
49,29	Ans. 49 dls. 29 cents.

2. At 21 cents 9 mills per lb. what will 187 lb. of coffee come to? Ans. 40 dolls. 95 cts. 3 mills.

3. What will 27 cwt of iron come to at 4 dollars 56 cents per cwt.? Ans. 123 dolls. 12 cts.

4. How much will 281 yards of tape come to at 9 mills per yard? Ans. 2 dolls. 52 cents 9 mills.

5. What will 371 yards of broadcloth come to at 5 dollars 79 cts. per yard? Ans. 2148 dolls. 9 cents.

6. How much will 29½ yards of mode come to at 75 cents per yard? Ans. 22 dolls. 12 cents 5 mills.

7. What will 23,625 feet of boards come to at 8 dollars 25 cents per M.?

23,625
8,25

118125
47250
189000

194,90625 Ans. 194 dls. 90 cts. 6 ms.

8. How much will 712 feet of boards come to at 14 dollars per thousand? Ans. 9 dolls. 96 cents 8 mills.

9. What will 25,650 feet of clear boards come to at 17 dolls. 50 cts. per thousand. Ans. 448 dls. 87 cts. 5 mills.

			dols. cts.	*dols. cts. m.*
10.	15,859 feet clear boards		17 50 per M.	277 53 2
11.	812	do.	14	11 36 8
12.	376	do.	12 75	4 79 4
13.	31,496 merchantable	do.	8	251 96 8
14.	269	do.	6 75	1 81 5
15.	4,114 refuse	do.	3 37	13 86 4
16.	393 maple	do.	8 per foot	31 44
17.	57 mahogany		32	18 24
18.	195 gallons molasses		57 per gall.	111 15
19.	189 do. rum		93	175 77
20.	243 yards baize,		23 per yard	55 89
21.	197 feet of clear boards		2 per foot	3 94

DIVISION OF DECIMALS.

Rule. Divide as in whole numbers, and from the right hand of the quotient point off as many places for decimals as the decimal places in the dividend exceed those of the divisor. If the places of the quotient are not so many as the rule

requires, supply the defect by prefixing cyphers. If at any time there be a remainder, or the decimal places in the divisor are more than those in the dividend, cyphers may be annexed to the dividend, and the quotient carried to any degree of exactness.

EXAMPLES.

92),863972(,009391	,853)89,000(104,337, &c.
828	853
359	3700
276	3412
837	2880
828	2559
92	3210
92	2559
	6510
	5971
	539

The various kinds that ever occur in division are included in the following cases, viz.

Divide	by	Ans.
,803	,22	3,65
,803	2,2	,365
,803	22	,0365
80,3	,22	365
80,3	2,2	36,5
80,3	22	3,65
222	,365	608,21+
222	3,65	60,821+
222	365	,60821+

As multiplying by 10, 100, 1000, &c. is only removing the separating point of the multiplicand so many places to the right hand as there are cyphers in the multiplier, so to divide by the same, is only removing the separatrix, in the same manner, to the left.

PRACTICAL QUESTIONS.

1. When butter is sold at 12 cents 8 mills per lb. how many lb. may be bought for 224 dollars?

,128)224,000(1750
128

960
896

640
640 Ans. 1750 lb.

Here the cyphers annexed to the dividend being equal to the decimal places in the divisor, the quotient is a whole number.

2. If 673 bushels of wheat cost 786 dols. 73 cents 7 mills, what is it per bushel?

673)786,737(1,169
673

1137
673

4643
4038

6057
6057 Ans. 1 dol. 16 cts. 9 mills.

In this example, as the divisor is a whole number, three places are pointed off in the quotient, to equal those in the dividend.

3. If 493 yards cost 4 dols. 43 cents 7 mills, what is it per yard? Ans. 9 mills.

4. If 125 gallons of molasses cost 95 dollars, what is 1 gallon worth? Ans. 76 cents.

5. If 205 yards of durant cost 107 dollars, 62½ cents, what is it per yard? Ans. 52½ cents.

REDUCTION OF DECIMALS.

CASE I.

To reduce a vulgar fraction to its equivalent decimal.

RULE. Divide the numerator by the denominator, and the quotient will be the decimal required.

EXAMPLES.

1. Reduce $\frac{3}{4}$ to a decimal.

4)3,00

,75

2. What is the decimal of $\frac{1}{2}$? Ans. ,5
3. What is the decimal of $\frac{1}{4}$? ,25
4. What is the decimal of $\frac{3}{20}$? ,15
5. What is the decimal of $\frac{17}{25}$? ,68
6. Express $\frac{7}{8}$ decimally. ,875

CASE II.

To reduce numbers of different denominations to their equivalent decimal values.

RULE I. Write the given numbers perpendicularly under one another for dividends, proceeding orderly from the least to the greatest?

II. Opposite to each dividend, on the left hand, place such a number for a divisor as will bring it to the next superior name, and draw a line between them.

III. Begin with the highest, and write the quotient of each division, as decimal parts, on the right hand of the dividend next below it, and the last quotient will be the decimal sought.

EXAMPLES.

1. Reduce 14*s*. 5½*d*. to the decimal of a pound.

4	2
12	5,5
20	14,4583

Ans. ,7229

2. Reduce 15 shillings to the decimal of a pound. Ans. ,75
3. Reduce 3 qrs. 18 lb. to the decimal of a cwt. Ans. ,910714+
4. Reduce 2 qrs. 2 nails to the decimal of a yard. Ans. ,625
5. Reduce 14 gals. 3 quarts to the decimal of a hogshead. Ans. ,2341+

Case III.

To find the decimal of any number of shillings, pence and farthings, by inspection.

Rule. Write half the greatest even number of shillings for the first decimal figure, and let the farthings in the given pence and farthings possess the second and third places; observing to increase the second place by 5 if the shillings be odd, and the third place by 1 when the farthings exceed 12, and by 2 when they exceed 37.

EXAMPLES.

1. Find the decimal of 13*s.* 9¾*d.* by inspection.

,6	half of 12*s.*
5	for the odd shilling.
39	farthings in 9¾*d.*
2	for excess of 37.
,691	

2. Find by inspection the decimal of 15*s.* 8¼*d.*, 9*s.* 3½*d.*, 19*s.* 6¾*d.*, 3*s.* 6*d.* and 2*s.* 11½*d.* Ans. ,784 ,465 ,978 ,175 ,148.

Case IV.

To find the value of any given decimal in the terms of the integer.

Rule I. Multiply the decimal by the number of parts in the next less denomination, and cut off as many places for the remainder to the right hand as there are places in the given decimal.

II. Multiply the remainder by the parts in the next inferior denomination, and cut off a remainder as before.

III. Proceed in this manner through all the parts of the integer, and the several denominations standing on the left hand make the answer.

EXAMPLES.

1. Find the value of ,691 of a pound.

,691	
20	
13,820	
12	
9,840	
4	
3,360	Ans. 13*s.* 9¾*d.*

2. What is the value of ,9 of a shilling? Ans. 10¾*d.*

3. What is the value of ,592 of a cwt.?
Ans. 2 qrs. 10 lb. 4 oz. 13+drams.

4. What is the value of ,258 of a tun of wine?
Ans. 1 hhd. 2+galls.

5. What is the value of ,12785 of a year?
Ans. 46 days 15 hours 57 min. 57+sec.

Decimal Tables of Coin, Weight and Measure.

TABLE I.

English Coin.

£. 1 the Integer.

sh.	dec.	sh.	dec.
19	,95	9	,45
18	,9	8	,4
17	,85	7	,35
16	,8	6	,3
15	,75	5	,25
14	,7	4	,2
13	,65	3	,15
12	,6	2	,1
11	,55	1	,05
10	,5		

pence.	decimals.
6	,025
5	,020833
4	,016666
3	,0125
2	,008333
1	,004166

farth.	decimals.
3	,003125
2	,0020833
1	,0010416

TABLE II.

Eng. Coin. 1 *shill*

Long Meas. 1 *foot*

The Integer.

pence and inches.	decimals.
6	,5
5	,416666
4	,333333
3	,25
2	,166666
1	,083333

farth.	decimals.
3	,0625
2	,041666
1	,020833

TABLE III.

Troy Weight.

1 *lb.* the Integer.

Ounces the same as Pence in the last Table.

penny weight	decimals.
10	,041666
9	,0375
8	,033333
7	,029166
6	,025
5	,020833
4	,016666
3	,0125
2	,008333
1	,004166

grains	decimals.
12	,002083
11	,001910
10	,001736
9	,201562
8	,001389
7	,001215
6	,001042
5	,000868
4	,000694
3	,000521
2	,000347
1	,000173

1 *oz.* the Integer.

Penny wt. the same as Shillings in the first Table.

grains.	decimals.
12	,025
11	,022916
10	,020833
9	,01875
8	,016666
7	,014583
6	,0125
5	,010416
4	,008333
3	,00625
2	,054166
1	,202083

TABLE IV.

Avoirdupois Wt.

112 *lb.* the Integer.

qrs.	decimals.
3	,75
2	,5
1	,25

lbs.	decimals.
14	,125
13	,116071
12	,107148
11	,098214
10	,089286
9	,080357
8	,071428
7	,0625
6	,053571
5	,044643
4	,035714
3	,026786
2	,017857
1	,008928

ounces.	decimals.
8	,0 4464
7	,003906
6	,003348
5	,002790
4	,002232
3	,001674
2	,001116
1	,000558

¼ oz.	decimals.
3	,000418
2	,000279
1	,000139

Decimal Tables of Coin, Weight and Measure.

TABLE V.

Avoirdupois Wt.

1 *lb.* the Integer.

oz.	*decimals.*
8	,5
7	,4375
6	,375
5	,3125
4	,25
3	,1875
2	,115
1	,0625

drms.	*decimals.*
8	,03125
7	,027343
6	,023437
5	,019531
4	,015625
3	,011718
2	,007812
1	,003906

TABLE VI.

Liquid Measure.

1 *tun* the Integer.

gals.	*decimals.*
100	,396825
90	,357141
80	,317460
70	,27
60	,238095
50	,198412
40	,158730
30	,119047
20	,079365
10	,039682
9	,035714
8	,031746
7	,027
6	,023809
5	,019841
4	,015873
3	,011904
2	,007936
1	,003968

pints.	*decimals.*
4	,001984
3	,001488
2	,000992
1	,000496

A *Hhd.* the Integer.

gals.	*decimals.*
30	,476190
20	,317460
10	,158730
9	,142857
8	,128694
7	,111111
6	,095238
5	,079365
4	,063492
3	,047619
2	,031746
1	,015873

pints.	*decimals.*
3	,005952
2	,003968
1	,001684

TABLE VII.

Measure.

Liquid. *Dry.*

1 *Gallon.* 1 *Quarter.*

Integer.

pt.	*decim.*	*bu.*
4	,5	4
3	,375	3
2	,25	2
1	,125	1

q.pt.	*decim.*	*pk.*
3	,09375	3
2	,0625	2
1	,03125	1

decimals.	*q.pks.*
,0234375	3
,015625	2
,0078125	1

decimals.	*pts.*
,005859	3
,003906	2
,001953	1

TABLE VIII.

Long Measure.

1 *Mile* the Integer.

yards.	*decimals.*
1000	,568182
900	,511364
800	,454545
700	,397727
600	,340909
500	,284091
400	,227272
300	,170454
200	,113636
100	,056818
90	,051136
80	,045454
70	,039773
60	,034091
50	,028409
40	,022727
30	,017045
20	,011364
10	,005682
9	,005114

Decimal Tables of Coin, Weight and Measure.

yards.	decimals.
8	,004545
7	,003977
6	,003409
5	,002841
4	,002273
3	,001704
2	,001139
1	,000568

feet.	decimals.
2	,0003787
1	,0001894

inch.	decimals.
6	,0000947
5	,000079
4	,0000631
3	,0000474
2	,0000319
1	,0000158

TABLE IX.

Time.

1 *Year* the Integer.

Months the same as Pence in the second Table.

days	decimals.
365	1,000000
300	,821918
200	,547945
100	,273973
90	,246575
80	,219178
70	,191781
60	,164383
50	,136986
40	,109589
30	,082192
20	,054794
10	,027397
9	,024657

days.	decimals.
8	,021918
7	,019178
6	,016438
5	,013698
4	,010959
3	,008219
2	,005479
1	,002739

1 *Day* the Integer.

hours.	decimals.
12	,5
11	,458333
10	,416666
9	,375
8	,333333
7	,291666
6	,25
5	,208333
4	,166666
3	,125
2	,083333
1	,041666

min.	decimals.
30	,020833
20	,013888
10	,006944
9	,00625
8	,00555
7	,004861
6	,004166
5	,003472
4	,002777
3	,002083
2	,001388
1	,000694

TABLE X.

Cloth Measure.

1 *Yard* the Integer.

Quarters the same as Table IV.

nails.	decimals.
2	,125
1	,0625

TABLE XI.

Lead Weight.

1 *Fother* the Integer.

hund	decimals.
10	,512820
9	,461538
8	,410256
7	,358974
6	,307692
5	,256410
4	,205128
3	,153846
2	,102564
1	,051282

qrs.	decimals.
2	,025641
1	,012820

ibs.	decimals.
14	,0064102
13	,0059523
12	,0054945
11	,0050366
10	,0045787
9	,0041208
8	,0036630
7	,0032051
6	,0027472
5	,0022893
4	,0018315
3	,0013736
2	,0009157
1	,0004578

SINGLE RULE OF THREE DIRECT.

The Single Rule of Three Direct teaches, from three numbers given, to find a fourth, that shall be in the same proportion to the third as the second is to the first.

If *more* requires *more*, or *less* requires *less*, the proportion is direct.

RULE 1. Make the number that is the demand of the question, the third term, the number that is of the same name or quality the first term, and the remaining number will be the middle term.

Reduce the first and third numbers into the same, and the second into the lowest denomination mentioned.

2. Multiply the second and third numbers together, and divide the product by the first, and the quotient (if there be no remainder) is the answer, or fourth number required.

If after division there be a remainder, reduce it to the next denomination below that to which the second number was reduced, and divide by the same divisor as before, and the quotient will be of this last denomination. Proceed thus with all the remainders till you have reduced them to the lowest denomination, which the second number admits of, and the several quotients taken together will be the answer required.

The method of proof is by reversing the question.

EXAMPLES.

1. If 2 yards of cloth cost 4*s.* what will 125 yards come to?

yds.	*s.*	*yds.*
If 2	: 4	:: 125
		4
		2)500
		20)250
Ans.		£.12 10

Proof.

yds.	£.	*s.*	*yds.*
If 125	: 12	10	:: 2
	20		
	250		
	2		
	125)500(4 shillings.		
	500		

2. If 1 bushel of corn cost 75 cents, what will 257 bushels come to?

bush. *cts.* *bush.*
If 1 : 75 :: 257
75

1285
1799

192,75 Ans. 192 dols. 75 cts.

3. What will 931 yards of shalloon come to, at 55 cts. 4 ms. per yard? Ans. 515 dols. 77 cts. 4 ms.

4. How many bushels of wheat at 1 dol. 12 cts. per bushel, can I have for 81 dols. 76 cts? Ans. 73 bushels.

5. What will 94 cwt. of iron come to, at 4 dols. 97 cts. 2 mills per cwt.? Ans. 467 dols. 36 cts. 8 ms.

6. What will 349 lbs. of beef come to, at 2*d.* per lb.?
Ans. £.2 18 2

7. At 3*s.* per yard what will 59 yards of cloth come to?
Ans. £.8 17 0

Prove this answer to be right.

8. How many lbs. of beef, at 5 cts. per lb. may be bought for 29 dols. 85 cts.?

cts. *lb.* *dls. cts.*
If 5 : 1 :: 29,85
1

,05)29,85

597 Ans. 597 lbs.

9. How many hhds. of salt at 4 dols. 90 cts. per hhd. can I have for 392 dols.? Ans. 80 hhds.

10. How many lbs. of coffee, at 1*s.* 7*d.* per lb. may be bought for £.8 12 7? Ans. 109 lbs.

11. When 25 yds. of cloth cost £.2 12 1, what is it per yd?

yds. £. *s.* *d.* *yd.*
If 25 : 2 12 1 :: 1
20

52
12

625
1

25)625(12 | 25
50 —
2*s.* 1*d.*
125
125 Ans. 2*s.* 1*d.*

12. If 56 bushels of corn cost 42 dols. 56 cts. what is it per bushel?

bush. *dls.* *cts.* *bush.*
If 56 : 42,56 :: 1
1

56)42,56(,76
392

336
336 Ans. 76 cts.

13. If 112 lbs. of beef cost 18*s.* 8*d.* what is it per lb.?
Ans. 2 pence.

14. If 673 bushels of rye cost 769 dols. 23 cts. 9 ms. what is 1 bushel worth? Ans. 1 dol. 14 cts. 3 ms.

15. What is 1 yard of baize worth, when 97 yards cost £.10 12*s.* 2½*d.* Ans. 2*s.* 2½*d.*

16. When iron is sold at 5 dols. 4 cts. per cwt. what is it per lb.? Ans. 4 cts. 5 mills.

17. If 891 gallons of molasses cost £.176 6*s.* 10½*d.* what is it per gallon? Ans. 3*s.* 11½*d.*

Prove this answer to be right.

18. What will 253 quintals of fish come to, at 17*s.* 6*d.* per quintal? Ans. £.221 7*s* 6*d.*

19. At 5 dols. 50 cts. per thousand, what will 37 thousand of boards come to? Ans. 203 dols. 50 cts.

20. What will 4 hhds. of rum come to, containing viz. 79¼, 84, 101½, and 112 gals. at 6*s.* 9*d.* per gal.? Ans. £.127 4 9

21. What will 327 hhds. of salt come to, at 5 dols. 25 cts. per hhd.? Ans. 1716 dols. 75 cts.

22. If 3 and 4 make 9, how many will 6 and 8 make? Ans. 18

23. If a chest of hyson tea, weighing 79 lb. neat, cost £.32 11*s.* 9*d.* what is it per lb.? Ans. 8*s.* 3*d.*

24. B owes £.2119 17*s.* 6*d.* and he is worth but £.1324 18*s.* 5¼*d.*; if he delivers this to his creditors, how much do they receive on the pound? Ans. 12*s.* 6*d.*

25. A owes B £.569 6*s.* 8*d.* but failing in trade, he is able to pay but 15*s.* 6*d.* on the pound: how much is B to receive and what is his loss? Ans.—He is to receive £.441 4 8
His loss is - - 128 2 0

26. A merchant failing in trade, owes in all 29475 dols. and delivers up his whole property, worth 21894 dols. 3 cts.: how much per cent. does he pay, and what is B's loss, to whom he owed 325 dols.? Ans.—He pays 74 dols. 28 cts. per ct.
And B loses 83 dols. 59 cts.

27. How much will 4 cwt. 1 qr. 19 lb. of butter come to, at 9*d.* per lb.?

lb.
400=4 hundred.
48=excess, 12 per cent.
28=1 quarter.
19

lb.		*d.*		
If 1	:	9	::	495
				9
				12)4455
				20)371 3

Ans. £.18 11*s.* 3*d.*

28. If 3 qrs. 26 lb. of steel cost 13 dols. 20 cts. what is it per pound? Ans. 12 cents.

29. If 16 cwt. 3 qrs. of steel cost 157 dols. 45 cts. what is 1 qr. worth? Ans. 2 dols. 35 cts.

Prove this answer to be right.

30. A captain of a ship is provided with 18000 lb. of bread for 150 seamen, of which each man eats 4 lb. per week, how long will it last them? Ans. 30 weeks.

31. How long would 2295 lb. of beef last for 45 seamen, if they get 1 lb. each, and that three times a week?
Ans. 17 weeks.

32. Suppose 120 seamen are provided with 7200 gallons of water for a cruise of 4 months, each month 30 days; how much is each man's share per day? Ans. 2 quarts.

33. A ship's company of 16 men is on an allowance of 6 ounces of bread per day, when meeting with a vessel from which they are supplied with 2 cwt. of bread; what addition will this make to their daily allowance, if they suppose their voyage to last 28 days? Ans. 8 ounces.

34. If 17 tuns 2 hhds. of wine cost 5468 dols. 40 cts. how much is one pint worth? Ans. 15 cts. 5 ms.

35. How much will 4 pieces of linen, containing, viz. 35½, 36, 37½, and 38 yards come to, at 79 cts. per yard?
Ans. 116 dols. 13 cts.

36. How many crowns of 110 cents each will pay a debt of £.82 16*s.* 7¼*d.* Ans. 251 crowns.

37. If 203 tons 9 cwt. 3 qrs. 3 lb. of tallow cost £.4558 3*s.* 0*d.* what does 1 ton cost. Ans. 22 8 0

38. How many cwt. of rice may be bought for 487 dols. 50 cts. when 7 lb. cost 25 cts.? Ans. 121 cwt. 3 qrs. 14 lb.

39. When 9 dols. 36 cts. is paid for 2 qrs. 22 lb. of sugar, what is 7 lb. worth? Ans. 84 cts.

40. When 47 cwt. 3 qrs. of sugar cost £.182 4*s.* 11*d.* what is 1 qr. worth? Ans. 19*s.* 1*d.*

41. If 6 lb. 6 oz. Avoirdupois cost 5 dols. 10 cts. what is it per ounce? Ans. 5 cents.

42. Bought 40 tubs of butter weighing 36 cwt. 2 qrs. 14 lb. neat, for 472 dols. 2 cts.; paid cooperage 12 cts. per tub; salt and labour 4 dols. 83 cts. 8 mills; storage 6 dols. 48 cts.—I would know what it stands me in per lb.?
Ans. 11 cts. 9 ms.

43. How much will a grindstone 32 inches diameter, and 6 inches thick, come to, at 5*s.* per cubic foot?

See Reduction cubic measure.

32 the diameter.
16 = half the diameter.

48
16

288
48

768
6

inch.		*s.*			*s.*	*d.*
If 1728	:	5	::	4608	: 13	4 Ans. 13*s.* 4*d.*

44. What will a grindstone, 28 inches diameter, and 3½ inches thick, come to, at 1 dol. 90 cts. per cubic foot?
Ans. 2 dols. 26 cts 2 m.

45. When a man's yearly income is 949 dollars, how much is it per day? Ans. 2 dols. 60 cts.

46. At 4½ per cent. what is the commission on 1525 dols.?
Ans. 68 dols. 62 cts. 5 ms.

47. What is the interest of 456 dollars for 1 year, at 6 per cent? Ans. 27 dols. 36 cts.

48. At 5 dols. 50 cts. per M. what will 21,186 feet boards come to? Ans. 116 dols. 52 cts. 3 ms.

49. When boards are sold at 18 dols. per M. what is it per foot? Ans. 1 cent 8 mills.

50. What will 98 feet of boards come to at 4 cts. per foot?
Ans. 3 dols. 92 cts.

51. What will 49 thousand 3 hundred and 25 casts of staves come to at 17 dols per thousand?

NOTE. Staves are counted by casting three at a time; 40 casts make 1 hundred, and 10 hundred 1 thousand.

	M.		*dols.*		*M.*	*h.*	*c.*	
If	1	:	17	::	49	3	25	
	10				10			
	10				493			
	40				40			
								dols. cts. m.
Casts	400				19745			Ans. 839 16 2

52. What will 19 M. 8 and 15 casts of white oak hhd. staves come to, at 31 dols. per M.? Ans, 614 dols. 96 cts. 2 ms.

53. What will 22 M. 9 and 37 casts of red oak hhd. staves come to, at 13 dols. per M.? Ans. 298 dols. 90 cts. 2 ms.

54. What will 56 bundles of hoops come to at 25 dols. per M. of 30 bundles?

NOTE. Hoops are sometimes bound in bundles of 30 hoops each, and four such bundles are 1 hundred, and ten hundred or 40 bundles, 1 thousand. But they are generally bound in bundles of 40 each, 3 bundles making 1 hundred, and ten hundred or thirty bundles, 1 thousand.

hund. dols. 3)56

If 10 : 25 :: $18\frac{2}{3}$ hundreds

25

90

36

$16\frac{2}{3}$

1|0)46|$6\frac{2}{3}$

$46,6\frac{2}{3}$

Or *bund. dls. bund.*

30 : 25 : : 56

25

280

112

3|0)140|0

$46,66\frac{2}{3}$

Ans. 46 dols. $6\frac{2}{3}$ dimes, or $66\frac{2}{3}$ cts.

55. How many bushels of salt, at 4 dols. 75 cts. per hhd. can I have for 326 dollars?

dls. cts. bush. dols.

If 4 75 : 8 : : 326 Ans. 549 bushels, when measured on board the vessel.

If 4 75 : $7\frac{1}{2}$: : 326 Ans. 514 bushels three pecks, nearly when measured ashore.

56. What is the tax on lands, &c. valued at 2957 dollars in the direct tax, at 28 cents and three mills on the 100 dollars? Ans 8 dollars 36 cents 8 mills.

57. What is the tax on a house, valued at 900 dollars, in the direct tax, at $\frac{3}{10}$ per cent?

dls. dls. dls.

If 100 : ,3 : : 900

,3

100)270,0

Ans. 2 dollars 70 cents.

Or as $\frac{3}{10}$ per cent. is equal to 3 mills on the dollar, multiplying the sum in dollars by 3, gives the answer in mills.

EXAMPLES.

58. What is the tax on 753 dollars at $\frac{3}{10}$ per cent.?

753 dollars
3 mills

2259 Ans. 2 dolls 25 cts 9 ms.

59. Find the tax on the following sums—

	dols.		*dls.*	*cts.*
viz.	1550	at $\frac{4}{10}$ per cent - - - - Ans.	6	20
	4560	$\frac{5}{10}$ - - - - -	22	80
	7850	$\frac{6}{10}$ - - - - -	47	10
	12680	$\frac{7}{10}$ - - - - - -	88	76
	16950	$\frac{8}{10}$ - - - - -	135	60
	24620	$\frac{9}{10}$ - - - - - -	221	58
	35840	1 - - - - -	358	40

60. What will a piece of land, measuring 48 feet length and 40 in width at each end, amount to at 20 dollars per square rod?

feet.
48
40

feet *dols.*
If $272\frac{1}{2}$: 20 :: 1920

By decimals. Ans. 141 dols. 4 cts.

If 272,25 : 20 :: 1920

61. A charter-party for a vessel of 186 tons commenced on the 28th of May, and ended on the tenth of October following: What does the hire amount to for that time, at 2 dols. per ton per month of 30 days?

186 tons.
2 dols. per mo.

days.
If 30 : 372
136

2232
1116
372

3,0)5059,2

1686,40 Ans. 1686 dols. 40 cts.

	days.
May - -	4
June - -	30
July - -	31
August - -	31
September -	30
October -	10
	136

In calculating the time, the days of receiving and discharging the vessel are *both* included.

INVERSE PROPORTION.

WHEREAS in the Rule of Three Direct, more requires more and less requires less, in this rule more requires less and less requires more.

RULE. After stating the terms as in the Rule of Three Direct, multiply the first and second terms together, and divide the product by the third, and the quotient is the answer.

EXAMPLES.

1. If 100 workmen complete a piece of work in 12 days, how many are sufficient to do it in three days?

d.		*m.*		*d.*
12	:	100	::	3
		12		

3)1200

400 Ans. 400 men.

2. If 8 boarders drink a barrel of cider in 12 days, how long would it last if 4 more came among them?

Ans. 8 days.

3. A ship's company of 15 persons is supposed to have bread to last their voyage, allowing each 8 ounces per day; when they pick up a crew of 5 persons in distress, to whom they are willing to communicate; what will the daily allowance of each person then be? Ans. 6 ounces.

4. When wheat is sold at 93 cents per bushel, the penny loaf weighs 12 ounces; what must it weigh when the wheat is 1 dol. 24 cts. per bushel? Ans. 9 ounces.

5. How many yards of baize, 3 qrs. wide, will line a cloak which has in it 12 yards of camblet, half yard wide?

Ans. 8 yards.

6. Suppose 400 men in a garrison are provided with provisions for thirty days; how many men must be sent out, if they would have the provisions last 50 days?

Ans. 160 men.

7. What sum should be put to interest to gain as much in 1 month, as 127 dollars would gain in 12 months?

Ans. 1524 dols.

COMPOUND PROPORTION.

Teaches to resolve such questions, as require two or more statings by simple proportion.

RULE. State the question, by placing the three conditional terms in this order: that which is the principal cause of gain, loss, or action, possesses the first place; that which denotes space of time, or distance of place, the second; and that which is the gain, loss, or action, the third: then place the other two terms, which move the question, under those of the same name, and if the blank place fall under the third, multiply the three last terms for a dividend, and the two first for a divisor; but if the blank fall under the first or second place, multiply the first, second and last terms together for a dividend, and the other two for a divisor; and the quotient will be the answer.

EXAMPLES.

1. If £.100 in 12 months gain £.5, how much will £.400 gain in 3 months?

£.		*mo.*		£.
100	:	12	::	5
400	:	3		
3				
100 1200				
12 5				
12\|00) 60\|00				
£.5				

Ans. £.5

If 8 men make 24 rods of wall in 6 days, how many men will build 18 rods in 3 days?

m.		*d.*		*r.*
8	:	6	::	24
		3		18
				6
		24		108
		3		8
		72	)	864(12
				72
				144
				144

Ans. 12 men.

3. If a family of 9 persons spend 450 dollars in 5 months, how much would be sufficient to maintain them 8 months, if five more were added to the family? Ans. 1120 dols.

4. What is the interest of £.240 for 50 days, at 5 per cent. per annum?

£.		*days.*		£.
100	:	365	::	5
240	:	50		
50				

100 × 12000
365 × 5

365|00)600|00(1 12 10½
365
235
20
365)4700(12
4380
320
12
365)3840(10
365
190
4
365)760(2
730
30

Ans. £.1 12 10½

N. B. By omitting to multiply by the rate per cent. and dividing 36500 by it, are found the fixed divisors of 7300 for 5, and 6083 for 6 per cent. per annum, sometimes used in calculating interest.

5. What is the interest of 654 dollars for 164 days, at 6 per cent. per annum?

100
365
6)36500
6083 the fixed divisor, found as above directed.

654 dollars.
164
2616
3924
654
6083)107256(17,632
6083
46426
42581
38450
36498
19520
18249
12710
12166
544

Ans. 17 dols. 63 cts. 2 ms.

6. What is the interest of 947 dollars, for 294 days, at 5 per cent. per annum?

947 dols.
294
3788
8523
1894
Fixed divisor 7300)278418(38,139
21900
59418
58400
10180
7300
28800
21900
69000
65700
3300

Ans. 38 dols. 13 cts. 9 ms.

VULGAR FRACTIONS.

FRACTIONS, or broken numbers, are expressions for any assignable parts of an unit; and are represented by two numbers, placed one above the other, with a line drawn between them.

The number above the line is called the *numerator*, and that below the line the *denominator*.

The denominator shows how many parts the integer is divided into, and the numerator shows how many of those parts are meant by the fraction.

Fractions are either proper, improper, compound or mixed.

1st. A *proper fraction* is when the numerator is less than the denominator, as $\frac{1}{3}$, $\frac{2}{5}$, $\frac{9}{11}$, $\frac{53}{96}$, &c.

2d. An *improper fraction* is when the numerator is either equal to or greater than the denominator, as $\frac{8}{8}$, $\frac{10}{9}$, $\frac{12}{12}$, $\frac{25}{20}$, &c.

3d. A *compound fraction* is a fraction of fractions, and known by the word *of*, as $\frac{1}{2}$ of $\frac{2}{3}$, $\frac{7}{9}$ of $\frac{9}{10}$, $\frac{15}{16}$ of $\frac{21}{28}$, &c.

4th. A *mixed number* or *fraction* is composed of a whole number and fraction, as $8\frac{1}{4}$, $17\frac{1}{2}$, $29\frac{3}{4}$ &c.

I. *To reduce a simple fraction to its lowest terms.*

RULE. Find a common measure by dividing the lower term by the upper, and that divisor by the remainder, continuing till nothing remains; the last divisor is the common measure; then divide both parts of the fraction by the common measure, the quotients express the fraction required.

NOTE. If the common measure happens to be 1, the fraction is already in its lowest term; and when a fraction hath cyphers at the right hand, it may be abbreviated by cutting them off, as $\frac{4}{5}|\frac{0}{0}$

EXAMPLE.

1. Reduce $\frac{91}{117}$ to its lowest term.

91)117(1
91
—
26)91(3
78
—
13)26(2
26

Common measure 13)$\frac{91}{117}$($\frac{7}{9}$ the answer.

Or, divide the terms of the fraction by any number that will divide them without a remainder; divide the quotients in the same manner, and so on, till no number will divide them both, and the last quotients express the fraction in its lowest terms.

EXAMPLES.

2. Reduce $\frac{192}{576}$ to its lowest terms.

$$\frac{192}{576} = \frac{(8)\ 24}{72} = \frac{(8)\ 3}{9} = \frac{3}{3} = \frac{1}{3} \text{ the answer.}$$

3. Reduce $\frac{144}{168}$ to its lowest terms. - Ans. $\frac{6}{7}$
4. Reduce $\frac{114}{152}$ to its lowest terms. - - Ans. $\frac{3}{4}$
5. Reduce $\frac{2412}{2772}$ to its lowest terms. - Ans. $\frac{11}{13}$

II. *To reduce a mixed number to an improper fraction.*

Rule. Multiply the whole numbers by the denominator of the fraction, and to the product add the numerator for a new numerator, and place it over the denominator.

Note. To express a whole number fraction-wise, set 1 for a denominator to the given number.

EXAMPLES.

1. Reduce $5\frac{3}{8}$ to an improper fraction.

$$5 \times 8 + 3 = \frac{43}{8} \text{ the answer.}$$

2. Reduce $183\frac{5}{11}$ to an improper fraction. Ans. $\frac{2014}{11}$
3. Reduce $27\frac{3}{5}$ to an improper fraction. Ans. $\frac{138}{5}$
4. Reduce $514\frac{5}{16}$ to an improper fraction. Ans. $\frac{8229}{16}$

III. *To reduce an improper fraction to its proper terms.*

Rule. Divide the upper term by the lower, and the quotient will be the whole number; the remainder, if any, will be the numerator to the fractional part.

EXAMPLES.

1. Reduce $\frac{17}{5}$ to its proper terms.

$$5)17(3\frac{2}{5} \text{ the answer.}$$
$$15$$
$$2$$

2. Reduce $\frac{138}{5}$ to its proper terms. - Ans. $27\frac{3}{5}$
3. Reduce $\frac{8229}{16}$ to its proper terms. Ans. $514\frac{5}{16}$

IV. *To find the least common multiple or denominator.*

RULE. Divide the given denominators by any number that will divide two or more of them, without a remainder, and set the quotients and the undivided numbers underneath. Divide these quotients and undivided numbers by any number that will divide two or more of them as before, and thus continue, till no two numbers are left capable of being lessened.

Multiply the last quotient and the divisor or divisors together, and the product will be the least common denominator required.

EXAMPLES.

1. What is the least common measure of $\frac{5}{9}$, $\frac{7}{8}$, $\frac{6}{15}$, and $\frac{3}{16}$?

8)9 8 15 16

3)9 1 15 2

3 1 5 2

$3\times5\times2=30\times3\times8=720$, Ans.

2. What is the least number that can be divided by the nine digits without a remainder? Ans. 2520.

V. *To reduce vulgar fractions to a common denominator.*

RULE. Find a common denominator by the last case, in which divide each particular denominator, and multiply the quotient by its own numerator, for a new numerator, and the new numerators, being placed over the common denominator, express the fractions required in their lowest terms.

EXAMPLES.

1. Reduce $\frac{3}{4}$, $\frac{5}{9}$ and $\frac{7}{12}$ to a common denominator.

36 the common denominator.

4	$9\times3=27$
9	$4\times5=20$
12	$3\times7=21$

The fractions will be $\frac{27}{36}$, $\frac{20}{36}$, $\frac{21}{36}$.

2. Reduce $\frac{1}{2}$, $\frac{2}{3}$, $\frac{5}{6}$ and $\frac{7}{8}$ to a common denominator.

Ans. $\frac{12}{24}$, $\frac{16}{24}$, $\frac{20}{24}$, and $\frac{21}{24}$.

3. Reduce $\frac{2}{5}$, $\frac{1}{6}$, $\frac{3}{7}$ and $\frac{5}{21}$ to a common denominator.

Ans. $\frac{42}{105}$, $\frac{35}{105}$, $\frac{45}{105}$ and $\frac{25}{105}$.

4. *Reduce* $\frac{1}{3}$, $\frac{2}{5}$, $\frac{4}{15}$ and $\frac{5}{6}$ to a common denominator.

Ans. $\frac{15}{45}$, $\frac{27}{45}$, $\frac{12}{45}$ and $\frac{37}{45}$.

VI. *To reduce a compound fraction to a single one.*

RULE. Multiply all the numerators for a new numerator, and all the denominators for a new denominator, then reduce the new fraction to its lowest term by Case I.

EXAMPLES.

1. Reduce $\frac{3}{4}$ of $\frac{5}{6}$ of $\frac{9}{10}$ to a single fraction.

$$3\times5\times9=135 \quad 9,$$
$$4\times6\times10=240 \quad 16$$

——=——the answer.

2. Reduce $\frac{5}{9}$ of $\frac{4}{7}$ of $1\frac{1}{2}$ to a single fraction. Ans. $\frac{5}{21}$.

3. Reduce $\frac{3}{7}$ of $\frac{5}{8}$ of $\frac{4}{5}$ to a single fraction. Ans. $\frac{3}{14}$.

VII. *To reduce a fraction of one denomination to the fraction of another, but greater, retaining the same value.*

RULE. Reduce the given fraction to a compound one, by multiplying it with all the denominations between it and that denomination, to which you would reduce it; then reduce that compound fraction to a single one.

EXAMPLES.

1. Reduce $\frac{7}{8}$ of a penny to the fraction of a pound.

$$d.$$
$$7\times1\times1 \quad 7$$
$$8\times12\times20 \quad 1920$$

——=——the answer.

2. Reduce $\frac{4}{5}$ of a pennyweight to the fraction of a pound Troy. Ans. $\frac{1}{3000}$.

3. Reduce $\frac{4}{7}$ of a pound Avoirdupois to the fraction of a cwt. Ans. $\frac{1}{175}$.

VIII. *To reduce the fraction of one denomination to the fraction of another, but less, retaining the same value.*

RULE. Multiply the numerator by the parts contained in the several denominations between it and that denomination to which you would reduce it for a new numerator, and place it over the denominator of the given fraction.

EXAMPLES.

1. Reduce $\frac{1}{960}$ of a pound to the fraction of a penny.

$$1\times20\times12=240$$
$$960$$

——=$\frac{1}{4}$ the answer.

2. Reduce $\frac{1}{300}$ of a lb. troy to the fraction of a dwt.
Ans. $\frac{4}{5}$.

3. Reduce $\frac{1}{1000}$ of a cwt. to the fraction of a lb. Ans. $\frac{4}{7}$.

IX. *To find the value of the fraction in the known parts of the integer.*

Rule. Multiply the numerator by the known parts of the integer, and divide by the denominator.

EXAMPLES.

1. What is the value of $\frac{2}{3}$ of a £.?

2
20 shillings.

3)40

Ans. 13*s.* 4*d.*

2. What is the value of $\frac{3}{5}$ of a shilling? Ans. 4*d.* $3\frac{1}{5}$ qrs.

3. Reduce $\frac{3}{5}$ of a lb. Troy to its proper quantity.
Ans. 7 oz. 4 dwt.

4. Reduce $\frac{4}{5}$ of a mile to its proper quantity.
Ans. 6 fur. 16 poles.

X. *To reduce any given quantity to the fraction of a greater denomination of the same kind.*

Rule. Reduce the given quantity to the lowest denomination mentioned for a new numerator, under which set the integral part (reduced to the same name) for a denominator, and it will express the fraction required.

EXAMPLES.

1. Reduce 16*s.* 8*d.* to the fraction of a pound.

16 8
12

200 5
——=—the answer.
240 6

2. Reduce 2 quarters $3\frac{1}{2}$ nails to the fraction of an ell English.
Ans. $\frac{5}{8}$

3. *Reduce* 4*s.* $6\frac{1}{2}$*d.* to the fraction of a pound. Ans. $\frac{13}{480}$

ADDITION OF VULGAR FRACTIONS.

I. *To add fractions that have a common denominator.*

RULE. Add their numerators together, and place the sum over one of the given denominators.

EXAMPLES.

1. Add $\frac{1}{9}$, $\frac{2}{9}$, $\frac{4}{9}$, $\frac{5}{9}$ and $\frac{7}{9}$ together.

$$\begin{array}{r} 1 \\ 2 \\ 4 \\ 5 \\ 7 \\ \hline 19 \end{array}$$

$\frac{19}{9} = 2\frac{1}{9}$ the answer.

2. Add $\frac{7}{24}$, $\frac{11}{24}$ and $\frac{13}{24}$ together. Ans. $1\frac{7}{24}$.
3. Add $\frac{13}{20}$, $\frac{17}{20}$ and $\frac{9}{20}$ together. Ans. $1\frac{19}{20}$.
4. Add $\frac{7}{16}$, $\frac{13}{16}$ and $\frac{15}{16}$ together. Ans. $2\frac{3}{16}$.

II. *To add mixed numbers whose fractions have a common denominator.*

RULE. Add the fractions by the last case, and the integer as in whole numbers.

EXAMPLES.

1. Add $2\frac{1}{11}$, $3\frac{2}{11}$, $4\frac{4}{11}$ and $7\frac{9}{11}$ together.

$$\begin{array}{r} 2\frac{1}{11} \\ 3\frac{2}{11} \\ 4\frac{4}{11} \\ 7\frac{9}{11} \\ \hline 17\frac{5}{11} \end{array}$$

answer.

2. Add $13\frac{1}{15}$, $9\frac{4}{15}$ and $3\frac{7}{15}$ together. Ans. $25\frac{4}{5}$.
3. Add $1\frac{1}{12}$, $2\frac{5}{12}$, $3\frac{7}{12}$ and $4\frac{1}{12}$ together. Ans. 12.
4. Add $9\frac{13}{14}$, $7\frac{9}{14}$, $5\frac{5}{14}$ and $8\frac{1}{14}$ together. Ans. $31\frac{4}{7}$.

III. *To add fractions, having different denominators.*

RULE. Find the least common denominator by Case IV, in reduction, in which divide each denominator, and multiply

the quotient by its numerator; the sum of the products is a new numerator to the common denominator, and the fraction required.

EXAMPLES.

1. Add $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{8}$ and $1\frac{1}{2}$ together.

24 com. denominator.

3	8×	2=16
4	6×	3=18
6	4×	5=20
8	3×	7=21
12	2×	11=22

$\frac{97}{24}=4\frac{1}{24}$ the answer.

2. Add $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{7}$ and $\frac{1}{8}$ together. Ans. $1\frac{81}{280}$.
3. Add $\frac{1}{3}$, $\frac{2}{5}$, $\frac{4}{7}$, $\frac{3}{8}$ and $\frac{8}{15}$ together. Ans. $3\frac{47}{168}$.

IV. *To add mixt numbers whose fractions have different denominators.*

RULE. Add the fractions as in the last case, and the integers as in whole numbers.

EXAMPLES.

1. Add $5\frac{2}{3}$, $6\frac{7}{8}$ and $4\frac{1}{2}$ together.

24 com. denom.

$5\frac{2}{3}$	16
$6\frac{7}{8}$	21
$4\frac{1}{2}$	12
Ans. $17\frac{1}{24}$	$\frac{49}{24}=2\frac{1}{24}$.

2. Add $1\frac{3}{5}$, $\frac{4}{5}$ of $\frac{1}{3}$, and $9\frac{3}{20}$ together. Ans. $11\frac{1}{20}$.
3. Add $1\frac{9}{16}$, $6\frac{7}{8}$, $\frac{2}{3}$ of $\frac{1}{2}$ and $7\frac{1}{2}$ together. Ans. $16\frac{7}{16}$.

V. *When the fractions are of several denominations.*

RULE. Reduce them to their proper quantities by Case IXth in Reduction, and add as before.

EXAMPLES.

1. Add $\frac{7}{8}$ of a £. to $\frac{3}{16}$ of a shilling.

	s.	d.	15 common measure.
$\frac{7}{8}$ of a £.=	15	$6\frac{2}{3}$	10
$\frac{3}{16}$ of a s.=	0	$3\frac{3}{8}$	9
Ans.	15	$10\frac{4}{15}$	$\frac{19}{15}=1\frac{4}{15}$.

2. Add $\frac{2}{3}$ of a yard, $\frac{3}{4}$ of a foot, and $\frac{7}{8}$ of a mile together.
Ans. 1540 yds. 2 ft. 9 inches.

3. Add $\frac{1}{3}$ of a week, $\frac{1}{4}$ of a day, and $\frac{1}{2}$ of an hour together.
Ans. 2 days $14\frac{1}{2}$ hours.

SUBTRACTION OF VULGAR FRACTIONS.

I. *To find the difference between simple fractions that have a common denominator.*

RULE. Subtract the less numerator from the greater, and under the remainder put the denominator.

EXAMPLES.

From	$\frac{4}{7}$	$\frac{11}{12}$	$\frac{14}{16}$	$\frac{17}{35}$	$\frac{105}{200}$
Take	$\frac{3}{7}$	$\frac{5}{12}$	$\frac{3}{16}$	$\frac{13}{35}$	$\frac{99}{200}$
Rem.	$\frac{1}{7}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{4}{35}$	$\frac{6}{200}$

II. *To subtract a fraction or mixt number from a whole number.*

RULE. Subtract the numerator from the denominator, and under the remainder put the denominator, and carry one to be deducted from the integer.

EXAMPLES.

From	3	6	10	9	100
Take	$0\frac{3}{16}$	$0\frac{7}{8}$	$0\frac{1}{16}$	$5\frac{1}{2}$	$99\frac{99}{100}$
Rem.	$2\frac{13}{16}$	$5\frac{1}{8}$	$9\frac{15}{16}$	$3\frac{1}{2}$	$0\frac{1}{100}$

III. *To subtract simple fractions that have no common denominator.*

RULE. By case IV, in Reduction, find a common denominator, in which divide each denominator, and multiply the quotient by its numerator; the difference between the products thus found is a numerator to the common denominator, and the answer required.

EXAMPLES.

From $\frac{17}{21}$ take $\frac{9}{14}$

42 com. denom.

21 $2\times17=34$
14 $3\times\ 9=27$

Rem. $\frac{7}{42}=\frac{1}{6}$ the answer.

From	$\frac{5}{6}$	$\frac{11}{12}$	$\frac{5}{6}$	$\frac{8}{15}$	$\frac{202}{216}$
Take	$\frac{1}{4}$	$\frac{2}{4}$	$\frac{4}{5}$	$\frac{9}{20}$	$\frac{7}{144}$
Rem.	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{30}$	$\frac{1}{12}$	$\frac{397}{432}$

In order to distinguish the greater of two fractions, let them be reduced to a common denominator, as in case V in Reduction; and that fraction, whose numerator is greater, is the greater fraction: the difference between the new numerators, being set over the common denominator, will shew the excess or inequality.

EXAMPLE.

Which of the two is the greater fraction, $\frac{11}{12}$ or $\frac{14}{16}$?

48 com. denom.

12 $4\times11=44$
16 $3\times15=45$

Ans. $\frac{14}{16}$ is greater by $\frac{1}{48}$

IV. *To subtract a fraction or mixt number from a mixt number, when the fractional part to be subtracted is greater than that from which it is to be subtracted.*

RULE. Find a common denominator and a new numerator, as in the last case, and then subtract the numerator of the greater fraction from the common denominator, and to the re-

mainder add the less numerator, and set the sum of both for a new numerator over the common denominator, and carry one to the integral part, and proceed as in whole numbers.

EXAMPLES.

			27 common denominator.
From	$13\frac{1}{9}$		$3\times1 = 3$
Take	$8\frac{14}{27}$		$1\times14=14$
	$4\frac{13}{27}$		$\frac{14}{27}$

From	$6\frac{4}{7}$	$10\frac{3}{10}$	$12\frac{5}{12}$	$19\frac{5}{11}$
Take	$0\frac{6}{7}$	$1\frac{7}{12}$	$6\frac{1}{2}$	$0\frac{7}{15}$
Rem.	$5\frac{4}{7}$	$8\frac{23}{60}$	$5\frac{11}{12}$	$18\frac{118}{165}$

V. *When the fractions are of different denominations.*

RULE. Reduce them to their proper quantities, and subtract as before.

EXAMPLES.

1. From $\frac{7}{8}$ of a £. take $\frac{3}{10}$ of a shilling.

	s.	*d.*	15 common denominator.
$\frac{7}{8}$ of a £. =	15	$6\frac{2}{5}$	10
$\frac{3}{10}$ of a *s.* =	0	$3\frac{3}{5}$	9
Rem.	15	$3\frac{1}{15}$	

2. From $\frac{3}{4}$ of £. take $\frac{4}{5}$ of a shilling. Ans. 14*s.* 3*d.*
3. From $\frac{3}{4}$ of a lb. troy take $\frac{1}{6}$ of an ounce. Ans. 8 oz. 16 dwt. 16 grs.
4. From 7 weeks take $9\frac{7}{10}$ days. Ans. 5w. 4d. 7h. 12m.
5. From $\frac{1}{8}$ of a yard take $\frac{2}{3}$ of an inch. Ans. 5 inch. 1 bc.

MULTIPLICATION OF VULGAR FRACTIONS.

RULE. Reduce compound fractions to simple ones, and mixt numbers to improper fractions; then multiply the numerators together for a new numerator, and the denominators for a new denominator.

EXAMPLES.

1. Multiply $4\frac{1}{2}$ by $\frac{1}{8}$.

$$\frac{4\frac{1}{2}}{2}$$

$$\frac{9\times1}{2\times8}=\frac{9}{16}$$ the answer.

2. Multiply $\frac{3}{8}$ by $\frac{4}{5}$. Ans. $\frac{3}{10}$.
3. Multiply $\frac{7}{9}$ by $\frac{2}{5}$. Ans. $\frac{14}{27}$.
4. Multiply $48\frac{3}{5}$ by $13\frac{5}{6}$. Ans. $672\frac{3}{10}$.
5. Multiply $\frac{3}{4}$ of 9 by $\frac{7}{8}$. Ans. $5\frac{23}{32}$.
6. Multiply $\frac{9}{10}$ by $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{5}{6}$. Ans. $\frac{3}{8}$.

DIVISION OF VULGAR FRACTIONS.

RULE. Prepare the fractions if necessary; then invert the divisor, and proceed as in multiplication.

EXAMPLES.

1. Divide $\frac{4}{7}$ by $\frac{2}{3}$.

$$\frac{4\times3}{7\times2}=1\frac{2}{14}=\frac{6}{7}$$ the answer.

2. Divide $3\frac{1}{6}$ by $9\frac{1}{2}$.

$3\frac{1}{6}$ $9\frac{1}{2}$
6 2

$\frac{19}{6}$ $\frac{19}{2}$ Then $\frac{19\times2}{6\times19}=\frac{38}{114}=\frac{1}{3}$ the answer.

3. Divide 5 by $\frac{7}{10}$. Ans. $7\frac{1}{7}$.
4. Divide $\frac{9}{16}$ by $4\frac{1}{2}$. Ans. $\frac{1}{8}$.
5. Divide $9\frac{1}{6}$ by $\frac{1}{2}$ of 7. Ans. $2\frac{13}{21}$.
6. Divide $5205\frac{1}{4}$ by $\frac{4}{5}$ of 91. Ans. $71\frac{1}{8}$.

MISCELLANEOUS QUESTIONS

IN THE PRECEDING RULES.

1. What part is $28\frac{1}{2}$ of $33\frac{1}{2}$? Ans. $\frac{7}{8}$.
2. What will remain if $13\frac{1}{6}s.$ and $7\frac{1}{6}d.$ be taken from £.1? Ans. $5s.\ 6\frac{2}{3}d.$

3. Which is the greater fraction, $\frac{8}{13}$ or $\frac{9}{20}$?
Ans. $\frac{8}{13}$ is greater by $\frac{1}{260}$.

4. Of what number is 176 the $\frac{11}{15}$ part? Ans. 368.

5. By how much must you multiply $13\frac{3}{5}$ that the product may be $49\frac{1}{5}$? Ans. $3\frac{3}{5}$.

6. Find two numbers so that $\frac{3}{8}$ of the one will be as much as $\frac{7}{16}$ of the other? Ans. 126 & 208, or 63 & 104, &c.

7. Which is greater, $\frac{1}{5}$ of 6*s.* or 1*s.* $2\frac{1}{2}d.$
Ans. 1*s.* $2\frac{1}{2}d.$ is greater by $\frac{1}{10}d.$

8. A has $\frac{2}{3}$ of $\frac{3}{4}$ of a ship, and B $\frac{2}{5}$ of $\frac{1}{2}$, which is the greater share, and by how much? Ans. A's share is greater by $\frac{1}{30}$.

9. A farmer being asked how many sheep he had, answered, that he had them in 5 fields; in the first he had $\frac{1}{4}$ of his flock, in the second $\frac{1}{5}$, in the third $\frac{1}{6}$, in the fourth $\frac{1}{12}$, and in the fifth 450; how many had he? Ans. 1200.

RULE OF THREE DIRECT IN VULGAR FRACTIONS.

RULE. Having stated the question, make the necessary preparations, as in Reduction of Fractions, and invert the first term; then proceed as in Multiplication of Fractions.

EXAMPLES.

1. If $\frac{1}{4}$ of a yard of cloth cost $\frac{2}{3}$ of a shilling, what will $\frac{7}{8}$ of a yard come to?

yd. *s.* *yd.*
If $\frac{1}{4}$: $\frac{2}{3}$:: $\frac{7}{8}$

inverted.

$$\frac{4\times2\times7}{1\times3\times8}\ s. = \frac{56}{24} = 2s.\ 4d.$$ the answer.

2. If $\frac{3}{16}$ of a ship cost £.273 2*s.* 6*d.* what are $\frac{5}{32}$ of her worth? Ans. £.227 12*s.* 1*d.*

3. If $\frac{1}{4}$ of a yard cost $\frac{2}{3}$ of a pound, what will $\frac{2}{5}$ of an ell English come to, at the same rate? Ans. 2.£

4. A person, having $\frac{3}{5}$ of a coal mine, sells $\frac{3}{4}$ of his share for £.171; what is the whole mine valued at?
Ans. £.380

SINGLE RULE OF THREE INVERSE IN VULGAR FRACTIONS.

EXAMPLES.

1. If 25⅓*s.* will pay for the carriage of an cwt. 145¼ miles, how far may 6½ cwt. be carried for the same money.

Ans. $22\frac{8}{26}$ miles.

2. If 3¼ yds. of cloth that is 1½ yard wide, be sufficient to make a cloak, how much must I have of that sort, which is ⅘ yard wide, to make another of the same bigness? Ans. 4⅞ yds.

3. If 3 men can do a piece of work in 4½ hours, in how many hours will 10 men do the same work? Ans. $1\frac{7}{20}$.

4. If the penny white-loaf weigh 7 oz. when a bushel of wheat cost 5*s.* 6*d.* what is the bushel worth when the penny white-loaf weighs but 2½ oz. Ans. 15*s.* 4⅘*d.*

PRACTICE

Is a contraction of the Rule of Three Direct, when the first term happens to be an unit or one, and has its name from its frequent use in business.

THE TABLE.

Parts of a £.					
s.	*d.*				
10		is	½		
6	8	-	⅓		
5		-	¼		
4		-	⅕		
3	4	-	⅙		
2	6	-	⅛		
2		-	1/10		
1	8	-	1/12		
1		-	1/20		

Parts of a shilling.			
d.			
6	is		½
4	-		⅓
3	-		¼
2	-		⅙
1½	-		⅛
1	-		1/12

Parts of a Ton.					
cwt.	*qr.*				
10		is	½		
5		-	¼		
4		-	⅕		
2	2	-	⅛		
2		-	1/10		
1		-	1/20		

Parts of a Cwt.			
qrs.	*lb.*		
2		is	½
1		-	¼
	16	-	⅐
	14	-	⅛
	8	-	1/14
	7	-	1/16
	4	-	1/28
	2	-	1/56

Parts of ½ Cwt.			
lb.			
28	is		½
14	-		¼
8	-		⅐
7	-		⅛
4	-		1/14
3½	-		1/16
2	-		1/28

Parts of ¼ Cwt.			
lb.			
14	is		½
7	-		¼
4	-		⅐
3½	-		⅛
2	-		1/14
1	-		1/28

Case I.

When the price is an aliquot or even part of a shilling.

Rule. Divide the given number by the part, and the quotient is the answer in shillings; what remains is to be reduced as in Compound Division.

EXAMPLES.

1. What will 4596 yards cost at 6*d.* per yard?

6*d.*	½	4596
2\|0		229\|8
		114 18

Ans. £.114 18*s.*

	Yds.		*d.*			£.	*s.*	*d.*
2.	3746	at	4	per yard,	Ans.	62	8	8
3.	1095		3	- - - -		13	13	9
4.	7596		2	- - - -		63	6	0
5.	3747		1	- - - -		15	12	3
6.	3203		1½	- - - -		20	0	4½

Case II.

When the price is pence, or pence and farthings, and no even part of a shilling.

Rule. Find the even parts for the price, and proceed as in Case I. and the sum of the quotients is the answer.

EXAMPLES.

1. What will 4937 yards come to, at 9*d.* per yard?

6	½	4937
3	½	2468 6
		1234 3
2\|0		370\|2 9

Ans. £.185 2 9

	Yds.		d.			£.	s.	d.
2.	2765	at	8	per yard.	Ans.	92	3	4
3.	3762		7	- - - -		109	14	6
4.	3159		7½	- - - -		98	14	4½
5.	1496		11	- - - -		68	11	4
6.	1895		10½	- - - -		82	18	1½
7.	4689½		5	- - - -		97	13	11½
8.	3689		8¼	- - - -		126	16	2¼
9.	1871		2½	- - - -		19	9	9½
10.	8914		8¼	- - - -		306	8	4½
11.	2563½		9½	- - - -		101	9	5¼
12.	95¾		10½	- - - -		4	3	9¼
13.	201¼		9	- - - -		7	10	11¼

Case III.

When the price is shillings, or shillings and pence, and an even part of a pound.

Rule. Divide the given quantity by the even part, and the quotient is the answer in pounds. If there be a remainder, reduce it as in Compound Division.

EXAMPLES.

1. At 6*s.* 8*d.* per yard, what will 473 yards come to?

6*s.* 8*d.* | ⅓ | 473

Ans. £.157 13*s.* 4*d.*

	yds.		s.	d.		£.	s.	d.
2.	387	at	10		Ans.	193	10	0
3.	478		5		- - -	119	10	0
4.	397		3	4	- - -	66	3	4
5.	797½		2	6	- - -	99	13	9
6.	159¼		1	8	- - -	13	5	5

Case IV.

When the price is shillings, or shillings and pence, which make no even part of a pound.

Rule. Find the even parts for the price, and divide as in Case III, or multiply the given quantity by the shillings, and take the even parts of shillings for the pence, as in Case II.

EXAMPLES.

1. What cost 287 yards at 17*s.* 6*d.* per yard?

First method.

287

s.	*d.*		
10	\| ½ \|	143	10
5	\| ¼ \|	71	15
2	6 \| ¼ \|	35	17 6

Ans. 251*l.* 2*s.* 6*d.*

Second method.

287

17 6

2009

287

6 | ½ | 143 6

2|0)502|2 6

Ans. 251*l.* 2*s.* 6*d.*

	yards.		*s.*	*d.*		Ans.	£	*s.*	*d.*
2.	8172	at	15				6129		
3.	3691		19				3506	9	
4.	4765		11	8			2779	11	8
5.	3718		18	4			3408	3	4
6.	709¼		12	6			443	5	7½
7.	213		14	10			157	19	6
8.	96½		2	9½			18	9	4¼
9.	158		5	8½			45	5	2½
10.	4705¾		3	9			882	6	6¾
11.	127		7	5¼			47	9	10½

CASE V.

When the price is an even number of shillings.

RULE. Multiply the quantity by half the shillings, doubling the first (or right hand) figure of the product for shillings, the rest are pounds.

EXAMPLES.

1. What will 788 yards come to, at 2 shillings per yard?

788

1 = half the shillings.

Ans. £.78 16

	yards.		*s.*	Ans.	£.	*s.*
2.	347	at	4		69	8
3.	638		6		191	8
4.	589¼		8		235	14
5.	246		10		123	0
6.	324¾		12		194	17
7.	523		14		366	2
8.	745		16		596	0
9.	373½		18		336	3
10.	270		20		270	0
11.	172½		22		189	15
12.	89¼		24		107	2

Case VI.

When the price is pounds, shillings, &c.

Rule. Multiply the integers of the given quantity by the pounds, and work for the shillings, &c. by such of the preceding rules as you think best, and work likewise for the fractional parts of the integer; the sum of these will give the answer.

EXAMPLES.

1. What will 173 cwt. 1 qr. 14 lb. of sugar come to, at £.3 15*s*. 6*d*. per cwt.?

			173	1	14
			3	15	6
s.	*d.*		519		
10		½	86	10	
5		¼	43	5	
	6	1/16	4	6	6
1 qr.		¼	0	18	10½
14 lb.		½	0	9	5¼
		Ans. £.	654	9	9¾

	cwt.	*qr.*	*lb.*		*s.*	*d.*		£.	*s.*	*d.*
2.	219	2	19	at	69	11	Ans.	767	18	6¼
3.	310	3	22		53	8		834	7	5½

In working questions of this kind, when the quantity is not above the multiplication table, the following method is used.

1. What will 45 cwt. 2 qrs. 14 lb. of sugar come to, at £.3 7 9 per cwt.

	3	7	9	
			5	
	16	18	9	
			9	
	152	3	9	price of 45 cwt.
2 qrs. ½	1	13	10½	price of 2 qrs.
14 lb. ¼	0	8	5½	price of 14 lb.
Ans. £.	164	11	1	

	tons.	*cwt.*	*qr.*	*lb.*		£.	*s.*	*d.*		£.	*s.*	*d.*
2.		57	2	8	- -	3	17	9	- -	223	16	2
3.		19	3	13	-	2	5	10	-	45	10	6
4.		75	3	25	- -		48	5	- -	183	18	4½
5.		2	1	18	-		59	8	-	7	3	10
6.		1	1	11	- -		63	9	- -	4	5	11¼
7.		0	3	19	-		54	0	-	2	9	7¾
8.	37	14	2	14	hemp	89	6	8	per ton	3370	13	2
9.	27	16	3	18	- -	90	10		- -	2520	0	5
10.		15	2		- -	92	5	-	-	71	9	10½
11.	17	10	2	-	-	91	10		- -	1603	10	9

1. What will 37 cwt. 3 qrs. 7 lb. of sugar come to, at 14 dols. 40 cts. per cwt.?

		14,40
		37
		10080
		4320
2 qrs.	½	720
1 qr.	½	360
7 lb.	¼	90
		544,50

Ans. 544 dols. 50 cts.

	tons.	*cwt.*	*qr.*	*lb.*		*dols.*	*cts.*		*dols.*	*cts.*
2.	24	18	3	18	of hemp at	289	50	per ton. Ans.	7221	73
3.	31	16				268	75		8546	25
4.	19	14	2	12	iron	110			2170	33 8
5.		17	3	24	cordage	14		per cwt.	251	50

	M.	*R.*	*per.*		*dols.*	*cts.*		*dols.*	*cts.*
6.	25	2	25	of land at	29		per acre. Ans.	744	3
7.	87	1	37		33			2886	88
8.	229	3	18		18	50		4252	45½
9		3	26		25			22	81½

1. How much will 49 M. 3 hund. 25 casts of staves come to, at 17 dols. per M.?

		49
		17
		343
		49
2 hund.	½	3,4
1	½	1,7
20 casts	½	,85
5	¼	,212
		839,162

Ans. 839 dols. 16 cts. 2 ms.

	M.	*hun.*	*casks.*		*dols.*		*dols.*	*cts.*
2.	19	8	15	W.O. hhd. staves	31 per M.	Ans.	614	96
3.	22	9	37	R. O. do. do.	13		298	90
4.	28	1	8	W.O. bbl. do.	16		449	92
5.	4	2	11		15		63	41

1. What will 8,767 feet of merchantable boards come to, at 38*s.* 6*d.* per M.?

8,767
38 6

70136
26301
6*d.* ½ 4383

20)837,529 shillings.

Ans. £.16 17 6¼

The fourth figure of the product of the remainder, multiplied by 12, is set down for pence, and the product of this last remainder multiplied by 4 for farthings.

		s.	*d.*		*£.*	*s.*	*d.*
2.	18,370 ft. mer. boards	39	8	per M. Ans.	36	8	8
3.	2,819 do. do. do.	37	4		5	5	2¾
4.	,327 do. do. do.	41	0		0	13	4¾
5.	,183 do. refuse do.	20	6		0	3	9

What is the amount of a seaman's wages from the 15th of March to the 6th of December following, being 8 months and 20 days, at 16 dollars per month?

16
8

128 for 8 months.
15 days 8
5 2,66⅔

138,66⅔ Ans. 138 dls. 66⅔ cts.

NOTE. In calculating the time of seamen's service, either the day of engaging or being discharged is taken, but not both.

What is the amount of a seaman's wages from the 15th of June to the 28th of May following, at 16 dols. per month?

Ans. 171 dols.

At £.4 11 3 per cwt. what will 3 qrs. 25½ lb. come to?

£.4 11 3

2 qrs.	½	2	5	7½
1 qr.	½	1	2	9¾
14 lb.	½	0	11	4⅞
7	½	0	5	8 7/16
3½	½	0	2	10 7/32
1	½	0	0	9 7/112
Ans.		£.4	9	2 12/224

What will 19 tons, 19 cwt. 3 qrs. 27½ lb. come to, at £.19 19*s* 11¾*d*. per ton? Ans. £.399 19*s*. 5 1/14 6/8 4/2 1/0

TARE AND TRET

Are allowances made in selling goods by weight.

Tare is an allowance made to the buyer for the weight of the hogshead, barrel, or bag, containing the commodity.

Tret is an allowance for waste, dust, &c. generally, at 4 lb. per 104 lb.

Cloff is an allowance for the turn of the scale, at 2 lb. per 3 cwt.

Gross weight is the whole weight of the goods, together with the hogshead, barrel, or bag, &c. that contain them.

Suttle is when part of the allowance is deducted from the gross.

Neat weight is what remains after all allowances are made.

Custom-house allowances on tea, coffee, and sugar.

	lb.
Tare on whole chests of bohea tea - -	70
on every ½ chest do.	36
on quarter do. - -	20
on every chest of hyson, or other green teas, the gross wt. of which is 70lb. or upwards	20
on every box of other tea, not less than 50 lb. or more than 70 lb. gross	18
If 80 lb. gross - -	20
And from 80 lb. gross and upwards - -	22

Which tare shall include rope, canvass, and other coverings.	
Tare for all other boxes of tea, according to invoice, or actual weight thereof.	
Tare for coffee in bags 2 per 100	
- - - in bales	3 do.
- - - in casks	12 do.
On sugar, other than loaf—	
- - - in casks	12 do.
- - - in boxes	15 do.
- - - in bags or mats	5 do.

There is an allowance of two per cent. for leakage on the quantity which shall appear to be contained in any cask of liquor subject to duty by the gallon; and 10 per cent. on all beer, ale and porter in bottles, and 5 per cent. on all other liquors in bottles in lieu of breakage, or the duties may be computed on the actual quantity, at the option of the importer, to be made at the *time of entry*.

EXAMPLES.

1. Sold ten casks of allum, weighing gross 33 cwt. 2 qrs. 15 lb. tare 15 lb. per cask: what is the amount at 23*s.* 4*d.* per cwt?

	cwt. qr. lb.
gross	33 2 15
tare	1 1 10
neat	32 1 5

10 casks.
15 lb. per cask.

112)150

*C.*1 1 10 tare.

Ans. £.37 13 6½.

2. At 1 dol. 25 cts. per lb. what will 3 chests of hyson tea come to, weighing gross 96 lb. 97 lb. and 101 lb.; tare 20 lb. per chest? Ans. 292 dols. 50 cts.

3. At 9 dols. 49 cts. per cwt. what will 3 hhds. of tobacco come to, weighing gross, viz.

	cwt.	*qrs.*	*lb.*	*lb.*
No. 1.	9	3	25	tare 149
2.	10	2	12	150
3.	11	1	25	158

Ans. 265 dols. 46½ cts.

4. At 79*s.* 9*d.* per cwt. how much will 4 hhds. of madder come to, weighing gross, viz.

	cwt.	*qrs.*	*lb.*	
No. 1.	10	3	4	
2.	11	2	13	
3.	10	1	16	
4.	14	3	19	tare 14 lb. per cwt.
14 lb. ⅛	47	2	24	gross.
	5	3	24	tare
	41	3	0	neat. Ans. £166 9 6¾

5. At 62*s.* per cwt. what will a hhd. of sugar come to, weighing gross 7 cwt. 1 qr.; tare 12 lb. per cwt.?

Ans. £20 1 4

6. At 21 cts. per lb. what will 6 hhds. of coffee come to, weighing gross, viz.

No. 1.	7	1	14	tare 96
2.	8	2	21	98
3.	7	1	21	91
4.	6	3	25	90
5.	7	0	23	89
6.	8	1	12	100

Ans. 964 dols. 32 cts.

7. What would the above coffee amount to, allowing 12 lb. per cwt. as tare on the gross weight?

Ans. 966 dls. 75 cts.

8. At 72*s.* 6*d.* per cwt. how much will 8 hhds. of sugar come to, weighing gross each 8 cwt. 3 qrs. 7 lb; tare 12 lb. per cwt. Ans £228 3 7¼

9. At 23 cents per lb. what will 4 bags of coffee come to, weighing gross 450 lb. tare 2 per cent. or 2 lb. per 100 lb?

Ans. 101 dols. 43 cts.

10. At 12 dols. 50 cents per cwt. what will 3 barrels of sugar come to, weighing gross, viz.

	cwt.	qrs.	lb.	
No. 1.	2	2	10	
2.	2	1	21	
3.	2	0	15	tare 21 lb. per barrel.

Ans. 82 dols. 47 cts. 7 ms.

11. At 15 dols. 40 cts. per cwt. what will 4 hhds. sugar come to, weighing gross, viz.

No. 1.	7	3	13	
2.	8	1	10	
3.	7	2	12	
4.	8	1	21	tare 12 lb. per cwt.

Ans. 443 dols. 43 cts. 7 ms.

12. A has in his possession a hhd. of sugar, weighing gross 9 cwt 3 qrs owned equally between him and B. It is required to know how much sugar he should weigh out to B, allowing tare 12 lb per cwt? Ans. 4 cwt. 1 qr. 11½ lb.

13. At 19½ cts per lb what will 2 hhds of coffee come to, weighing gross 15 cwt. 3 qrs. 11 lb. allowing custom-house tare, or 12 lb. per 100?

15 3 11

1500=fifteen hundred.
180=15×12 for excess in each cwt.
84=three quarters.
11

Gross	1775		1775
Tare	213	Tare	12 per 100
Neat	1562		213,00

19½

14058
1562
781

30459 cts. Ans. 304 dols. 59 cts.

14. B buys of C a hogshead of coffee, weighing gross 3 cwt. 2 qrs. tare 12 lb. per cwt. what will it amount to at 23 cts. per lb.? Ans. 218 dols. 50 cents.

15. If custom-house tare, or 12 lb. per 100, were allowed on the above coffee, what would it amount to, and what difference would it make to the buyer?

Ans. It amounts to 215 dols. 35 cts. 3 ms. being 3 dols. 14 cts. 7 ms. in his favour.

16. What is the gross weight of a hogshead of tobacco, weighing neat 11 cwt. 1 qr.; tare 14 lb. per cwt.?

Ans. 12 cwt. 3 qrs. 12 lb.

FELLOWSHIP

Is when two or more join their stocks and trade together, dividing their gain or loss, in proportion to each person's share in the joint stock.

SINGLE FELLOWSHIP

Is when different stocks are employed for a certain equal time.

RULE. As the whole stock is to the whole gain or loss, so is each man's particular stock to his particular share of the gain or loss.

EXAMPLES.

1. A and B buy certain merchandizes, amounting to £.120, of which A pays £.80, and B £.40, and they gain by them £.32: what part of it belongs to each?

A £.80
B 40

As 120 : 32 :: $\begin{cases} 80 \\ 40 \end{cases}$ Ans. £.21 6 8 A.
10 13 4 B.

2. A ship worth 8400 dollars being lost at sea, of which $\frac{1}{4}$ belonged to A, $\frac{1}{3}$ to B, and the remainder to C, what loss will each sustain, supposing they have 6000 dols. insured?

Ans. A's loss 600, B's 800, and C's 1000 dols.

3. A and B have gained 1260 dollars, whereof A is to have 10 per cent. more than B; what is the share of each?

Ans. A's 660, B's 600 dols.

4. A bankrupt is indebted to A 500 dols. 37 cts. to B. 228 dols. to C 1291 dols 23 cts. to D 709 dols. 40 cts. and his estate is worth but 2046 dols. 75 cts. how much does he pay per cent. and what is each creditor to receive?

Ans. He pays 75 per cent. and A's part is 375 dols. $27\frac{3}{4}$ cts. B's 171 dols. C's 968 dols. $42\frac{1}{4}$ cts. and D's 532 dols. 5 cts.

5. Three boys, John, James and William, buy a lottery ticket for 3 dols. of which John pays 90 cts. James 1 dol. and William the remainder. This ticket is entitled to a prize of 2000 dollars, subject to a deduction of $12\frac{1}{2}$ per cent. how much is each to receive?

Ans. John 525 dols. James 583 dols. $33\frac{1}{3}$ cts. William 641 dols. $66\frac{2}{3}$ cts.

6. Three merchants made a joint stock—A put in £.565 6 8, B £.478 5 4, and C a certain sum, and they gained £.373 9 11, of which C took for his part £.112 11 11; required, A. and B's part of the gain, and how much C put in?

Ans. A's gain, £.141 6 8, B's £.119 11 4, and C put in £.450 7 8.

7. Three men have to share a legacy of 1500 dols. of which B is to have $\frac{1}{2}$, C $\frac{1}{4}$, and D. the remainder; but C relinquishes his part to B and D, leaving it to be divided between them, according to their shares in the whole. It is required to know how much of the legacy B and D receive respectively? Ans. B's part is 1000, D's 500 dols.

DOUBLE FELLOWSHIP

Is when the stocks are employed for different times.

RULE. Multiply each man's stock by its time, and add them together, then say—As the sum of the products is to the whole gain or loss, so is the product of each man's stock and time to his share of the gain or loss.

EXAMPLES.

1. B and C trade in company, B put in £.950 for 5 months, and C £.785 for 6 months, and by trading they gain £.275 18 4: What is each man's part of the profit?

B's stock $950 \times 5 = 4750$

C's do. $785 \times 6 = 4710$

As $\overline{9460}$: 275 18 4 :: $\begin{cases} 4750 : £.138\ 10\ 10\ \text{B.} \\ 4710 : \quad 137\ 7\ 6\ \text{C.} \end{cases}$

2. Two merchants enter into partnership for 16 months. A put into stock at first 1200 dols. and at the end of 9 months 200 dols. more; B put in at first 1500 dols. and at the expiration of 6 months took out 500 dols.; with this stock they gained 772 dols. 20 cts.: what is each man's part of it?

Ans. A's 401 dols. 70 cts.; B's 370 dols. 50 cts.

3. Two persons hired a coach in Boston, to go 40 miles, for 20 dols. with liberty to take in 2 more when they pleased. Now when they had gone 15 miles, they admit C, who wished to go the same route, and on their return, within 25 miles of Boston, they admit D for the remainder of the journey. Now as each person is to pay in proportion to the distance he rode, it is required to settle the coach-hire between them.

Ans. A & B 6 dols. 40 cts. each, C 5 dols. 20 cts. D 2 dols.

SIMPLE INTEREST

Is a compensation made by the borrower of any sum of money to the lender, according to a certain rate per cent. agreed on for the principal only.

The legal rate of interest in Massachusetts is 6 per cent.

Principal, is the money lent.

Rate, is the sum per cent. agreed on.

Amount, is the principal and interest added together.

GENERAL RULE. Multiply the principal by the rate per cent. and divide the product by 100, and the quotient is the answer for one year.

EXAMPLES.

1. What is the interest of £.496 for one year at 6 per cent?

496
6
29|76
20
15|20
12
2|40
4
1|60 Ans. £.29 15*s.* 2¼*d.*

2. What is the interest of £.383 15 9 for 2 years, at 8½ per cent?

383 15 9
8½
3070 6 0
191 17 10½
32|62 3 10½
20
12|43
12
5|26
4
1|06 £.32 12*s.* 5¼*d.* for one year.
2
Ans. 65 4 10½ for two years.

3. What will £.826 13 9 amount to in one year at 5 per ent.?

5=$\frac{1}{20}$)826 13 9 principal.
41 6 8¼ interest.

Ans. £.868 0 5¼ amount.

4. What is the interest of £.103 11 4, for 4 years, at 7½ er cent. per annum? Ans. £.31 1 4¾.

5. What will £.36 14 9 amount to, in 3 years, at 5 per ent. per annum? Ans. £.42 4 11½.

6. What is the amount of £.19 15 8, for 5 years, at 6¾ er cent. per annum? Ans. £.26 9 2¼.

7. How much is the interest of £.72 12 6, for 6 months; t 6 per cent. per annum?

72 12 6
6

4|35 15 0
20

7|15
12

1|80
4

3|20

£. s. d.
6 m. ½)4 7 1¾ for 1 year.

Ans. 2 3 6¾ for 6 months.

NOTE. When the time is months, multiplying by the rate for the me gives the answer. This rate is found by multiplying the time by ie given rate per cent. for a year, and dividing the product by 12. he quotient is the rate required, and is always equal to half the onths when the yearly rate is 6 per cent.

8. What is the interest of £25 19 3 for 8 months, at 6 er cent. per annum?

8 months.
6

12)48

4 rate=half the months.

25 19 3
4

1,03 17 0
20

0,77
12

9,24 Ans. £.1 0 9.

9. How much will £.53 9 4 amount to, in 20 months, at 6 per cent. per annum? Ans. £.53 16 3.

10. How much is the interest on a bond of £.295 17 10 for 18 months, at 8 per cent. per annum?

		295	17	10
	18			12 the rate for the time.
	8			
		35,50	14	0
12)144		20		
12		10,14		
		12		
		1,68		
		4		
		2,72		Ans. £.35 10s. 1½d.

11. How much is the interest of £.80 12 9, for 23 months, at 6 per cent. per annum? Ans. £.9 5 5¼.

12. How much is the interest of £.36 14 9 from 19th May to 25th October, at 6 per cent.?

36	14	9		4m.=⅓)2	4	1 for 1 year.
		6				
				0	14	8¼
2,20	8	6	1 m.=¼	0	3	8
20			6 d. =½	0	0	8¾
4,08			Ans.	0	19	1
12						
1,02						

13. What will £.187 14 9 amount to, from 11th June, 1797, to 26th October, 1798, at 6 per cent. per annum? Ans. £.203 4 5¾.

14. How much is the interest of £.19 13 7 from 3d January, 1797, to 18th May, 1798, at 6 per cent. per annum? Ans. £.1 12 5¼.

To find the interest of any sum for months, at 6 per cent. per annum, by contraction.

RULE. Multiply the pounds by the number of months; the first or units figure of the product is pence, and the rest

are shillings, observing to increase the pence in the product by 1 when they exceed 4.

EXAMPLES.

15. What is the interest of £.56 for 1, 5, 7, and 12 months?

56	56	56	56
mo. 1	5	7	12
Ans. 5*s.* 7*d.*	28*s.* 0*d.*	39*s.* 2*d.*	67*s.* 2*d.*

16. £.45 for 6 months. - - Ans. £.1 7 0
17. 324 5 - - - - 8 2 0
18. 19 7 - - - - 0 13 3
19. 11 1 - - - - 0 1 1

If there are shillings, &c.

To the pounds add the decimal of the nearest even number of shillings (this will be sufficiently exact for business) and multiply by the months as before, separate two figures of the product to the right, and the left hand figures are the shillings, then multiply the figures pointed off by 12, and the product, rejecting two figures to the right, is the pence of the answer.

2	4	6	8	10	12	14	16	18 shillings.
,1	,2	,3	,4	,5	,6	,7	,8	,9 decimals.

20. How much is the interest of £.347 5 9 for 3 months?

347,3
3

shillings 104,19

Ans. £.5 4*s.* 2*d.*

21. How much is the int. of £.195 15 10½ for 10 months?

195,8
10

shillings 195,80

Ans. £.9 15*s.* 9½*d.*

,80
12

9,60
4

2,40

The value of the remainder is thus shewn to be 9½*d.*

22. What is the interest of £590 19 9¾ for 3 years, 7 months and 19 days?

£591 nearly.
43

1773
2364
15 days ½ 295
3 ⅕ 59
1 ⅛ 19

2578,6+1 because it exceeds 4. (See Rule.)

£128 18 7

23. How much is the interest of £476 9 8 for 9 months and 13 days?

476,5
9

4288,5
10 days ⅓ 158,3
3 do. 1/10 47,6

449,49

Ans. £22 9 5¾

24. What is the interest of £ 40 for 7 years, 5 months, and 26 days?

40
89 months.

3560
15 days ½ 20
10 do. ⅓ 13
1 do. 1/10 1

359,4

Ans. £17 19 5

25. What is the interest of £240 for 50 days, at 6 per ct?

	240		
	6		
	14,40		
	20		
	8,00		
d.	d.		
365 : £14 8s. ::	50 : £1 19s. 5½d.		

Or by Compound Proportion.

240
50

6083)12000(1
6083

5917
20

6083)118340(19
6083

57510
54747

2763
12

6083)33156(5
30415

2741
4

6083)10964(¾
6083

4881

Ans. £1 19 5¾

SIMPLE INTEREST IN FEDERAL MONEY.

The principal given in English money, and the interest required in federal.

RULE, Reduce the given sum to shillings, the product gives the answer in cents, and the pence are mills nearly—the reason is, that at 6 per cent. per annum, one fifth of a dollar is the annual interest of a pound—that is, 20 cents for 20 shillings, or 1 cent for every shilling in any given sum.

EXAMPLES.

1. Required the interest of £194 15 3 for 1 year in federal money.

194 15 3
20

3895 cents. Ans. 38 dols. 95 cts. 3 mills.

2. What is the interest of £129 13 2 for 2 years in federal money?

129 13 2
20

2593,2 for 1 year.
2

5186,4 Ans. 51 dols. 86 cts. 4 ms.

3. What is the interest of £91 12 1 for 5 years, in federal money?

91 12 1
20

1832,1 for 1 year.
5

91,605 for 5 years. Ans. 91 dols. 60$\frac{1}{2}$ cts.

4. What is the interest of £139 17 2 for 4 months?

139 17 2
20

4 mo. $\frac{1}{3}$ 2797,2

9,32,4 Ans. 9 dols. 32 cts. 4 ms.

Principal in Federal Money, and Interest required in the same.

Rule. Multiply the principal by the rate per cent. and as you suppose 100 for a divisor, point off the quotient as in division of decimals.

The following rule answers the same purpose.

When the principal is dollars only, multiply by the rate, and from the product point off two figures to the right, the figures to the left hand of the point give the answer in dollars, and the rest are decimal parts or cents.

If there are cents, &c. in the principal, multiply by the rate and point off as above. The figures to the left of the point give the answer in the same name with the lowest denomination in the principal.

EXAMPLES.

5. What is the interest of 419 dols. for 1 year at 6 per cent?

419
6

25,14 Ans. 25 dols. 14 cts.

6. What is the interest of 173 dols. 50 cts. for 1 year, at 6 per cent.?

173,50
6

cents 1041,00 Ans. 10 dols. 41 cts.

7. What is the interest of 327 dols. 82 cts. 5 mills for 1 year, at 8 per cent?

327,82,5
8

mills 26226,00 Ans. 26 dols. 22 cts. 6 ms.

8. How much is the interest of 325 dollars for 3 years, at 6 per cent. per annum?

		Or thus,	
325		325	
6		18	rate for the time.
19,50	for 1 year.	2600	
3		325	
58,50	for 3 years.	58,50	

Ans. 58 dols. 50 cts.

When the time is months.

RULE. Multiply by half the number; this, as was before observed, is always equal to the rate, for the time, when the annual rate is 6 per cent. per annum.

EXAMPLES.

9. What is the interest of 284 dollars, for 8 months, at 6 per cent.?

284
4

11,36 Ans. 11 dols. 36 cts.

10. How much is the interest of 187 dols. 25 cts. for 16 months, at 6 per cent. per annum?

187,25
.8

cents 1498,00 Ans. 14 dols. 98 cts.

11. What is the interest of 95 dollars, for 2 months, at 6 per cent. per annum?

95
1

,95 Ans. 95 cents.

12. How much is the interest of 126 dols. 46 cents, for 9 months, at 6 per cent.?

126,46
4½

505,84
63,23

cents 569,07 Ans. 5 dols. 69 cts.

13. How much is the interest of 124 dols. for 1 month, at 6 per cent.?

½)124 Or 124
,62 ,5

,62,0 Ans. 62 cts.

14. What is the interest of 694 dols. 84 cts. for 9 months, at 10 per cent. per annum?

694,84 Or 694,84
10 7½=rate for the time.

cents 6948,40 for a year. 4863,88
347,42

6 ½ 3474,2
3 ½ 1737,1

cents 52,11,30

52,11,3 Ans. 52 dols. 11 cts. 3 m.

15. How much is the amount of 985 dollars, for 5 years and 8 months, at 6 per cent. per annum?

dols.	
985	
34	half the months.
3940	
2955	
334,00	interest.
985,	principal.
1319,90	amount. Ans. 1319 dls, 90 cts.

When the time is months and days, and the annual rate 6 per cent. multiply by half the months and one sixth of the days, which is equal to the rate, for the given time, and separate one figure to the right for the decimal in the rate, and proceed as usual. Should there be a remainder in taking a sixth of the days, reduce it to a vulgar fraction; this, and not the decimal, will always give the exact rate.

EXAMPLES.

16. What is the interest of 194 dols. for 4 months and 12 days, at 6 per cent.?

		194
m.	*m.*	2,2=to the rate found by the rule,
12 : 6 ::	4,4	or the annexed calculation.
	6	388
		388
	12)26,4	
	2,2	4,26,8

Ans. 4 dols. 26 cts. 8 ms.

17. How much is the interest of 263 dollars, 43 cts. for 2 months and 21 days, at 6 per cent.?

263,43	
1,3½	
79044	
26343	
13174	
cents 355,698	Ans. 3 dols. 55 cts, 6 ms.

18. How much is the interest of 318 dols. for 10 months and 16 days, at 6 per cent.?

318
5,2⅔

636
1590
⅓ 106
⅓ 106

dols. 16,74,8 Ans. 16 dols. 74 cts. 8 m.

19. What is the interest of 418 dols. for 1 year, 7 months and 17 days, at 6 per cent.?

418
9,7⅙

2926
3762
⅙ or ½ 209 } =348⅓
⅔ or ⅓ 139 }

dols. 40,89,4 Ans. 40 dols. 89 cts. 4 m.

418
5

6)2090

348⅓

20. How much is the interest of 268 dols. 44 cts. for 3 years, 5 months, and 26 days, at 6 per cent.?

268,44
20,9⅓

241596
536880
⅓ 8948

cents 5619,34,4 Ans. 56 dols. 19 cts. 3 m.

21. What is the interest of 1 dollar, for 18 days, at 6 per cent.?

1
,3

,00,3 mills. Ans. 3 mills.

One figure is separated for the decimal in the multiplier, and two cyphers are supplied and pointed, according to the general rule.

22. What is the interest of 910 dols. 50 cts. for 3 years, 9 months, and 26 days, at 7 per cent. per annum?

	910,50		Or thus, 910,50	
	7		22,91⅓	
	63,73,50		819450	
	3		182100	
			182100	
	191,20,5	for 3 years.	30350	
6 mo.	½ 31,86,7			
3 mo.	¼ 15,93,3		⅙)208,80,30\|0	at 6 per ct.
15 days	⅛ 2,65,5		34,80,1	
10 days	⅙ 1,77,0			
1 day	1/16 ,17,7		dols. 243,60,9	
	dols. 243,60,7		Ans. 243 dols. 60 cts. 8 ms.	

23. How much will 185 dols. 26 cts. amount to, in 2 years, 3 months, and 11 days, at 7½ per cent. per annum?

Ans. 216 dols. 94 cts. 7 ms.

24. What is the interest of 57 dols. 78 cts. for 1 year, 4 months, and 17 days, at 4 per cent. per annum?

Ans. 3 dols. 19 cts.

25. How much is the amount of 298 dols. 59 cts. from 19th May, 1797, to the 11th of August, 1798, at 8 per cent. per annum? Ans. 327 dols. 98 cts. 4 ms.

26. How much is the amount of 196 dollars, from June 14, 1798, to April 29, 1799, at 5¾ per cent. per annum?

Ans. 205 dols. 86 cts.

27. What is the interest of 658 dollars, from January 9 to October 9 following, at ½ per cent. per month?

Ans. 29 dols. 61 cts.

In the calculation of interest in federal money, thus far, the year is supposed to be 12 months of 30 days each, making it only 360 days. Most persons use this method of computing the time, but as it is 5 days less in a year than the true number, some merchants calculate by days without any regard to months, as being more accurate.

EXAMPLES.

28. What is the interest of 7086 dollars, for 39 days, at 6 per cent. per annum?

By Compound Proportion.

7086
39

63774
21258

dls.cts.
6083)276354(45 43
24332

33034
30415

26190
24332

18580
18249

331 Ans. 45 dols. 43 cts.

29. What is the interest of 87 dols. 56 cts. for 72 days, at 6 per cent. per annum?

87,56
72

17512
61292

cts. m.
6083)6304,32(103 6
6083

22132
18249

38830
36498

2332 Ans. 1 dol. 3 cts. 6 m

	dols.	*cts.*	*days.*				*dols.cts.m.*
30.	2962	19	for 254	at 6 per cent.	per ann.	Ans.	123 68 8
31.	35		256	-	-		1 47 2
32.	1733	97	102	-	-		29 7 5
33.	455	52	47	-	-		3 51 9
34.	215	80	125	-	-		4 43 4
35.	517	90	84	-	-		7 15 1
36.	73	63	92	-	-		1 11 3

The following method of calculating the interest upon accounts, when there are partial payments, is sometimes used.

1798	*dols.*		*days.*	*prod.princ.& time.*
January 2, Lent	100	on int. for	13	1300
15, Lent	110			
	210	- -	5	1050
20, Received	162			
	48	- -	14	672
February 3, Lent	95			
	143	- -	7	1001
10, Received	90			
	53	- -	6	318
16, Lent	186			
	239	- -	10	2390
26, Received,	70			
	169	- -	3	507
March 1, Lent	250			
	419	- -	2	838
3, Received	270			
	149	- -	10	1490
13, Received	143			
20, time of adjustment,	6	- -	7	42
				9608

		d.cts.	
Then	6083)9608(	1,57	interest at 6 per cent.
	6083	6,	the principal due.
	35250	7,57	the amount due March 20th.
	30415		
	48350		
	42581		
	5769		

By this method interest may be calculated on accounts, multiplying each sum by the days it is at interest, and taking the quotient of 36500, divided by the rate per cent. as a fixed divisor to the sum of the products. Thus, the rate in the last example being 6 per cent. the divisor is 6083; for 5 per cent, it would be 7300; for 7 per cent. 5214, &c.

If the time is *months*, multiply each sum by the months it is at interest, and take the quotient of 1200, divided by the rate as a divisor. Thus, for 6 per cent. the divisor is 200; for 5 per cent. 240; for 8 per cent. 150, &c.—(*See Compound Proportion.*)

IN COMPUTING INTEREST ON NOTES, &c.

It has generally been the custom to find the amount of the principal from the time the interest commenced to the time of settlement, and likewise the amount of each payment, and then deduct the amount of the several payments from the amount of the principal.

EXAMPLE.

A, by his note dated April 25th, 1798, promises to pay B 774 dols. 76 cts. on demand, with interest to commence 4 months after the date. On this note are the following endorsements:

Received, *Oct.* 12th, 1798, 260 dols. 19 cts.—*Oct.* 13th, 1798, 60 dols.—*Nov.* 2, 1798, 200 dols. And the settlement is made *Dec.* 15th, 1798.

CALCULATION.

The principal carrying interest from 25th Aug. 1798			774 76
Interest to Dec. 15, 1798	3 m. 20 days		14 20
Amount of the principal			788 96
		dols. cts.	
First payment, Oct. 12th, 1798		260 19	
Interest to Dec. 15th, 1798	2 ms. 3 days	2 73	
Second payment, Oct. 13, 1798		60 00	
Interest to Dec. 15th, 1798	2 ms. 2 days	0 62	
Third payment, Nov. 2, 1798		200 00	
Interest to Dec. 15th, 1798	1 m. 13 days	1 43	
Amount of the payments			524 97
Settlement is made for		dols.	263 99

RULE established by the Courts of Law in Massachusetts for making up judgments on SECURITIES FOR MONEY, *which are upon interest, and on which partial payments have been endorsed.*

Compute the interest on the principal sum, from the time when the interest commenced to the first time when a payment was made, which exceeds either alone or in conjunction with the preceding payments (if any) the interest at that time due: add that interest to the principal, and from the sum subtract the payment made at that time, together with the preceding payments (if any) and the remainder forms a new principal; on which compute and subtract the interest, as upon the first principal; and proceed in this manner to the time of the judgment. By this Rule, the payments are first applied to keep down the interest; and no part of the interest ever forms a part of a principal carrying interest.

The following example will illustrate the rule, in which the interest is computed at the rate of 6 per cent. by the year, that being the legal rate of interest in Massachusetts.

A, by his note dated January 1, 1780, promises to pay to B 1000 dols. in six months from the date, with interest from the date. On this note are the following endorsements:

Received, *April* 1, 1780, 24 dols.—*August* 1, 1780, 4 dols. *Dec.* 1, 1780, 6 dols.—*Feb.* 1, 1781, 60 dols.—*July* 1, 1781, 40 dols.—*June* 1, 1784, 300 dols.—*Sept.* 1, 1784, 12 dols.—*Jan.* 1, 1785, 15 dols.—*Oct.* 1, 1785, 50 dols. And the judgment is to be entered *Dec.* 1, 1790.

CALCULATION.

	dols.	cts.
The principal sum carrying interest from Jan. 1, 1780	1000	00
Interest to April 1, 1780, 3 months	15	00
Amount	1015	00
Paid April 1, 1780, a sum exceeding the interest	24	00
Remainder for a new principal	991	00
Interest on 991 dls. from April 1, 1780, to Feb. 1, 1781, 10 mo.	49	55
Amount	1040	55
Paid Aug. 1, 1780, a sum less than the interest then due $4 00		
Paid Dec. 1, 1780, do. do. 6 00		
Paid Feb. 1, 1781, do. greater than the int. then due 60 00		
	70	00

	dols. cts.
Remainder for a new principal	970 55
Interest on 970 dols. 55 cts. from Feb. 1, 1781, to July 1, 1781, 5 months	24 26
Amount	994 81
Paid July 1, 1781, a sum exceeding the interest	40 00
Remainder for a new principal	954 81
Interest on 954 dols. 81 cts. from July 1, 1781, to June 1, 1784, 2 years 11 months	167 09
Amount	1121 90
Paid June 1, 1784, a sum exceeding the interest	300 00
Remainder for a new principal	821 90
Interest on 821 dols. 90 cts. from June 1, 1784, to Oct. 1, 1785, 1 year 4 months	65 75
Amount	887 65
Paid Sep. 1, 1784, a sum less than the interest then due dls. 12 00	
Paid Jan. 1, 1785, do. do. 15 00	
Paid Oct. 1, 1785, do. greater with two last payments than interest then due 50 00	77 00
Remainder for a new principal	810 65
Interest on 810 dols. 65 cts. from Oct. 1, 1785, to Dec. 1, 1790 the time when judgment is to be entered 5 years 2 months	251 30
Judgment rendered for the Amount	1061 95

A TABLE, shewing the number of days, from any day in any month, to the same day in any other month, through the year.

From	Jan.	Fe.	Ma.	Ap.	Ma.	Jun.	Jul.	Au.	Sep.	Oc.	No.	De.
to Jan	365	334	306	275	245	214	184	153	122	92	61	31
Feb.	31	365	337	306	276	245	215	184	153	123	92	62
Mar	59	28	365	334	304	273	243	212	181	151	120	90
April	90	59	31	365	335	304	274	243	212	182	151	121
May	120	89	61	30	365	335	304	273	242	212	181	151
June	151	120	92	61	31	365	334	304	273	243	212	182
July	181	150	122	91	61	30	365	334	303	273	242	212
Aug.	212	181	153	122	92	61	31	365	334	304	273	243
Sep.	243	212	184	153	123	92	62	31	365	335	304	274
Oct	273	242	214	183	153	122	92	61	30	365	334	304
Nov	304	273	245	214	184	153	123	92	61	31	365	335
Dec	334	303	275	244	214	183	153	122	91	61	30	365

THE USE OF THE TABLE.

Suppose the number of days between the 3d of May and the 3d of November was required; look in the column under May for November, and against that month you will find 184.

If the given days be different, it is only adding or subtracting their inequality to or from the tabular number.—Thus, from May 3d to Nov. 17th is 184+14=198 days, and from Nov. 17th to May 3d is 181—14=167 days.

If the time exceed a year, 365 days must be added; thus from the 4th of February, 1798, to the 4th of Sept. 1799, is 212+365=577 days.

NOTE. In leap years, if the end of the month of February be in the time, one day must be added on that account.

COMPOUND INTEREST

Is that which arises both from the *principal* and *interest*; that is, when the interest on money becomes due, and not paid, it is added to the principal, and interest is calculated on this amount as on the principal before.

RULE. Find the simple interest of the given sum for one year, and add it to the principal, and then find the interest for that amount for the next year, and so on for the number of years required. Subtract the principal from the last *amount*, and the remainder will be the compound interest.

EXAMPLES.

1. What is the interest of £.246 14*s*. 6*d*. for 3 years, at 6 per cent. per annum?

5	$\frac{1}{20}$	246	14	6	
1	$\frac{1}{5}$	12	6	$8\frac{1}{2}$	first year's interest.
		2	9	4	
5	$\frac{1}{20}$	261	10	$6\frac{1}{2}$	amount of the first year.
1	$\frac{1}{5}$	13	1	$6\frac{1}{4}$	second year's interest.
		2	12	$3\frac{1}{2}$	
5	$\frac{1}{20}$	277	4	$4\frac{1}{4}$	amount of the second year.
1	$\frac{1}{5}$	13	17	$2\frac{1}{2}$	third year's interest.
		2	15	$5\frac{1}{4}$	
		293	17	0	amount of the third year.
		246	14	6	first principal.
		47	2	6	compound interest for 3 years.

Ans. £.47 2*s*. 6*d*.

2. What is the compound interest of £.760 10*s*. for 4 years, at 6 per cent. per annum? Ans. £.190 12*s*. $3\frac{1}{4}$*d*.

3. How much is the amount of £128 17*s.* 6*d.* for 6 years, at 6 per cent. per annum, compound interest?

Ans. £182 16 $2\frac{3}{4}$

4. How much is the amount of 500 dollars, for 3 years, at 6 per cent. per annum, compound interest?

5	$\frac{1}{20}$	500,	
1	$\frac{1}{5}$	25,	first interest.
		5,	
5	$\frac{1}{20}$	530,	
1	$\frac{1}{5}$	26,50	second interest.
		5,30	
5	$\frac{1}{20}$	561,80	
1	$\frac{1}{5}$	28,09	third interest.
		5,61,8	
		595,50,8 the am't. req.	Ans. $595 50 cts. 8m.

5. What is the amount of 629 dols. for 7 years, at 6 per cent. per annum, compound interest?

Ans. 945 dols. 78 cts. 3 ms.

6. How much is the compound interest of 1256 dols. for 15 years, at 6 per cent. per annum?

Ans. 1754 dols. 6 cts. 6 ms.

A TABLE shewing the amount of one pound or one dollar for any number of years under 33, *at the rates of* 5 *and* 6 *per cent. per ann. compound interest.*

Years.	5 Rates.	6	Years.	5 Rates.	6
1	1,05000	1,06000	17	2,29201	2,69277
2	1,10250	1,12360	18	2,40662	2,85434
3	1,15762	1,19101	19	2,52695	3,02559
4	1,21550	1,26247	20	2,65329	3,20713
5	1,27628	1,33822	21	2,78596	3,39956
6	1,34009	1,41852	22	2,92526	3,60353
7	1,40710	1,50363	23	3,07152	3,81975
8	1,47745	1,59384	24	3,22510	4,04893
9	1,55132	1,68949	25	3,38635	4,29187
10	1,62889	1,79084	26	3,55567	4,54938
11	1,71034	1,89829	27	3,73345	4,82234
12	1,79585	2,01219	28	3,92013	5,11168
13	1,88565	2,13292	29	4,11613	5,41838
14	1,97993	2,26090	30	4,32194	5,74349
15	2,07892	2,39655	31	4,53804	6,08810
16	2,18287	2,54035	32	4,76494	6,45338

The use of this Table is plain and easy, for multiplying the figures standing against the number of years, by the given principal, the product is the amount required.

7. What is the amount of 500 dollars, for 3 years, at 6 per cent. compound interest?

1,19101 the tabular number for the time.
500 the principal.

595,50500

Ans. 595 dols. 50 cts. 5 ms.

8. A merchant, on inspecting some old accounts in March, 1799, finds a settlement dated March, 1771, by which it appears there is due from him to A B £2 8s. this sum he pays with compound interest at 6 per cent. per annum. The amount of it is required?

5,11168 the tabular number for 28 years.
2,4 the principal with the shillings inserted decimally.

2044672
1022336

£12,268032
20

*s.*5,360640
12

*d.*4,327680
4

qrs. 1,310720

Ans. £12 5s. 4¼*d.* or 40 dols. 89 cts. 3 ms.

Calculated in Federal Money.

5,11168
8 dollars.

dols. 40,89344

Ans. 40 dols. 89 cts. 3 mills, as above.

COMMISSION AND BROKERAGE

Are compensations to Factors and Brokers for their respective services.

The method of operation is the same as in Simple Interest.

EXAMPLES.

1. What is the commission on £.596 18 4, at 6 per cent.?

```
596 18 4          Or thus, £.5 | 1/20 | 596 18 4
      6                        |      |
                             1 | 1/2  |  29 16 11
35|81 10 0                    |      |   5 19 4½
  20                         |      |
                             |      |  £.35 16 3½
16|30
  12
3|60
  4
2|40                    Ans. £.35 16 3½
```

2. What is the commission on 1974 dollars at 5 per cent.?

```
1974
   5
98,70                  Ans. 98 dols. 70 cts.
```

3. What is the commission on £.626 11 5 at 3½ per cent.?
Ans. £.18 8 7

4. What is the commission on £ 1258 17 3 at 7¾ per cent.?
Ans. £.93 3 1¼

5. What is the commission on 2176 dols. 50 cents, at 2½ per cent.? Ans. 54 dols. 41 cts. 2 m.

6. The sales of certain goods amount to 1873 dols. 40 cts. what sum is to be received for them, allowing 2½ per cent. for commission, and ¼ per cent. for prompt payment of the neat proceeds? Ans. 1821 dols. 99 cts. 9 ms.

7. Required the neat proceeds of certain goods amounting to £.456 11 8, allowing a commission of 2½ per cent.

£.5 $\frac{1}{20}$ | 456 11 8

2½ ½ | 22 16 7 commission at 5 per cent.

11 8 3½ commission at 2½ per cent.

Ans. £.445 3 4½ neat proceeds.

8. What is the commission on £.1371 9 5 at 5 per cent.?
Ans. £.68 11 5½

9. What is the commission on £.1958 at 5½ per cent.?
Ans. £.107 13 9½

10. What is the commission on £.1859 7 6 at ⅞ per cent.?
Ans. £.16 5 4½

11. What is the brokerage on 1853 dols. at ¾ per cent.?
Ans. 13 dols. 89 cts. 7 m.

12. What is the brokerage on £.874 15 3 at ¼ per cent.?
Ans. £.2 3 8¾

13. What is the brokerage on 1298 dols. 53 cts. at ⅜ per cent.?

1298,53
3

8)3895,59

dols. 4,86,94 Ans. 4 dols. 86 cts. 9 m.

14. What is the brokerage on £.1321 11 4 at 1½ per cent.? Ans. £.14 17 4

15. A factor receives 988 dollars to lay out, after having deducted his commission of 4 per cent. how much will remain to be laid out?

d.
100
4

If 104 : 100 :: 988 : 950 dols. the answer.

16. A factor has in his hands 3690 dollars, which he is directed to lay out in iron, reserving from it his commission of 2½ per cent. on the purchase; the iron being 95 dols. per ton: how much did he purchase?
Ans. 37 tons, 17 cwt. 3 qrs. 16$\frac{4}{19}$ lb.

INSURANCE

Is an exemption from hazard, by paying or otherwise securing a certain sum, on condition of being indemnified for loss or damage.

Policy is the name given to the instrument, by which the contract of indemnity is effected between the insurer and insured.

Average loss is 5 per cent.; that is, if the insured suffer any loss or damage not exceeding 5 per cent. he bears it himself, and the insurers are free.

RULE. The method of operation as in interest.

EXAMPLES.

1. What is the premium of insuring £924 at 7 per cent.?
Ans. £64 13 7

2. What is the premium on 1650 dollars, at 12 per cent.?
Ans. 198 dols.

3. What is the premium of insuring 1250 dollars, at 7½ per cent.? Ans. 93 dols. 75 cts.

4. What is the premium of insuring 4500 dollars, at 25 per cent.? Ans. 1125 dols.

5. What is the premium of insuring 1650 dollars, at 15½ per cent.? Ans. 255 dols. 75 cts.

6. What is the premium of insuring 1873 dollars, at ½ per cent.? Ans. 2 dols.. 34 cts. 1 m.

7. What sum is to be received for a policy of 1658 dols. deducting the premium of 23 per cent.?
Ans. 1276 dols. 66 cts.

8. What sum must a policy be taken out for, to cover 1800 dollars, when the premium is 10 per cent.?

100 Policy.
10 Premium.
—
90 sum covered. If 90 : 100 :: 1800 Ans. 2000 dols.

d. *d.* *d.*

Proof: 2000 dollars at 10 per cent.

10
200,00

the policy 2000
the premium 200
sum covered 1800 dols.

9. What sum must a policy be taken out for, to cover 3926 dols. 7 cts. when the premium is 6 per cent.?
Ans. 4176 dols. 67 cts.

GENERAL AVERAGE.

Whatever the master of a ship in distress, with the advice of his officers and sailors, deliberately resolves to do, for the preservation of the whole, in cutting away masts or cables, or in throwing goods overboard to lighten his vessel, which is what is meant by jettison or jetson, is in all places permitted to be brought into a general average, in which all, who are concerned in ship, freight and cargo, are to bear an equal or proportionable part of the loss of what was so sacrificed for the common welfare; and it must be made good by the insurers in such proportions as they have underwritten.

EXAMPLES

Of Adjusted Averages.

1. A loaded ship met with such bad weather, that the master and mariners found it impossible to save her without throwing part of her cargo overboard, which they are authorized to do for preservation. Being thus necessitated, they threw such goods as lay nearest at hand, and lightened the ship of 10 casks of hardware, and 40 pipes of Madeira wine, which they judged sufficient to keep her from sinking. Soon after that, the ship arrived at her destined port, and then an average bill was immediately made in order to adjust the loss, and to pay the proprietors of those goods, which were thrown overboard, for the good of the whole.

Average accruing to ship ——, for goods thrown overboard for preservation of ship, freight and cargo.

Ship valued at - - - -	dols.	12,000
Freight (wages and victuals deducted) -		3,000
Thomas Nugent's value of goods - -		4,000
Thomas Morgan's value of goods - -		2,500
James Simpson's value of goods - -		8,500
Andrew Wilson for 40 pipes of wine -		4,000
Laurence Ward for 10 casks of hardware -		6,000
		40,000
Mr. Andrew Wilson's goods thrown overboard were valued at		4,000
Mr. Laurence Ward - - do. - - - -		6,000
		10,000

If 40,000 give 10,000 loss, what loss will 100 give?

Ans. 25 per cent.

The ship must pay to A. W. and L. W. for 12000 dollars, at 25 per cent.	3000
The freight 3000 dollars, at the same rate	750
Thomas Nugent, for 4000 dollars, at the same rate	1000
Thomas Morgan, for 2500 dollars, at the same rate	625
James Simpson, for 8500 dollars, at the same rate	2125
A. W. and L. W. receive of the owners of the goods saved, and the ship's owners	7500
Their property being insured, the underwriters pay them	2500
	10,000

2. The Sea Horse, Capt. Dix, laden with hemp, cordage, and iron, bound from Riga, to Boston, ran on shore, coming through the grounds at Elsineur. The captain hired a great number of men, and several lighters, to lighten the ship, and to get her afloat again, which was done; but he was obliged to pay 409 dols 23 cts. for their assistance. This expence being incurred to preserve both ship and cargo, the average must consequently be general. When the ship arrived at Boston, the captain immediately made a protest and an average bill, which was thus stated:

Average accruing to the ship Sea Horse, from Riga to Boston, in 1799, for assistance in getting off the strand of Elsineur.

For sundry charges paid at the Sound for lighters and assistance in getting off the ship	*dols.*	409	23
Protest and postage		35	37
		444	60
The ship's freight money		3460	
Wages for all the people, 4 ms. and 20 d.	560		
Victuals for do.	300	860	
		2600	
The ship Sea-Horse valued at		12000	
Freight valued at		2600	
William Jenkins for value of hemp		18000	
Daniel Jones for value of cordage		4000	
Enoch Flinn for value of iron		2400	
	dols.	39000	

If 39000 dols. lose 444 dols. 60 cts. what will 100 dols. lose?

Ans. 1 dol. 14 cts.

The ship must bear 12000 dls. at 114 cts. per 100 dls.	136 80
The freight 2600 dols. at the same rate	29 64
William Jenkins for 18000	205 20
Daniel Jones for 4000	45 60
Enoch Flinn for 2400	27 36
dols.	444 60

BUYING AND SELLING STOCKS.

Stock, in the sense in which it is here used, is a fund established by government, or individuals in a corporate capacity, the value of which is variable.

EXAMPLES.

1. What is the amount of 1565 dollars national bank stock, at 134 per cent.?

	1565
	134
	6260
	4695
	1565
	2097,10

Ans. 2097 dols. 10 cts.

2. What is the amount of 2958 dols. bank stock, at 25 per cent. advance?

		2958
25	¼	739,50
		3697,50

Ans. 3697 dols. 50 cts.

	dols.				*dols. cts.*
3.	6959	of 8 per cent. stock	at 110	per ct. Ans.	7654,90
4.	1796	6 - -	91½	- -	1643,34
5.	1284	3 - -	54¼	- -	696,57
6.	3172	deferred	89	- -	2823,08
7.	1518	state notes	83⅜	- -	1271,32½
8.	1686	Union Bank	128	- -	2158,08

DISCOUNT

is the abating of so much money to be received before it is due, as that money, if put at interest, would gain in the same time and at the same rate.

Thus 100 dollars would discharge a debt of 106 dollars payable in 12 months, discount at 6 per cent. per annum, because the 100 dollars received would, if put to interest, regain the 6 dollars discount.

RULE. As 100 dollars, with the interest for the given time, is to 100, so is the given sum to the present worth, and the difference between the present worth and the given sum is the discount.

EXAMPLES.

1. What is the present worth of 450 dols. due in 6 months, discount at 6 per cent. per annum?

6 *m.* $\frac{1}{2}$ 6

3

100

103 : 100 : : 450 Ans. 436 dols. 89 cts. 3 m.

2. How much is the discount of £308 15*s.* due in 18 months, at 8 per cent. per annum? Ans. £33 1 7$\frac{7}{7}$

3. What is the present worth of 5150 dls. due in 4$\frac{1}{2}$ months, discounting at the rate of 8 per cent. per annum, and allowing 1 per cent. for prompt payment? Ans. 4950 dols.

4. A is to pay 5927 dols. on the 19th of April, 1799, and 5389 dols. the 19th of July following: it is required to know how much money will discharge both sums on the 19th of January, 1799, discounting at 8 per cent. per annum?

Ans. 11569 dols. 43 cts. 7 ms.

Though the discount found by the preceding method is thought to be the sum that should be deducted for the present payment, in justice to both parties, yet in business the interest for the time is taken for the discount.

EXAMPLES.

5. What ready money will discharge a note of 150 dollars, due in 60 days, allowing legal interest, or 6 per cent. per annum as discount?

150
1=half the months.

150

150 the debt.
1,50 the interest.

148,50 Ans. 148 dols. 50 cts.

6. Bought goods to the amount of 950 dollars, at 90 days credit, what ready money will discharge it, allowing the interest for the time at 6 per cent. per annum as discount?

Ans. 935 dols. 75 cts. if calculated for 3 months.
935 dols. 95 cts. if calculated for 90 days.

When the interest for the time is allowed as discount, it is presumed that neither party suffers any loss, but the following statement evinces the contrary.

A owes B 100 dollars payable in 12 months, for present payment of which B allows 6 dollars or the interest for the time, and receives 94 dollars; this sum he immediately lends to C for the same space of time, and then receives the amount, being 99 dollars 64 cents, which is 36 cents less than he would have to receive from A, had he left the money in his hands; but if he had allowed A the discount, and not the interest, for the time, he would have received from him 94 dollars 34 cents, and this sum being put to interest, would amount to 100 dols. in one year, which shews that the discount, and not the interest, is the just deduction for prompt payment.

But when discount is to be made for present payment without any regard to time, the interest of the sum, as calculated for a year, is the discount.

EXAMPLES.

7. How much is the discount of 853 dols. at 2 per cent.?

853
2

dols. 17,06 Ans. 17 dols. 6 cents.

8. How much money is to be received for 985 dols. 75 cts. discounting 4 per cent.? Ans. 946 dols. 32 cts.

BANK DISCOUNT.

The method used among bankers, in discounting notes, &c. is to find the interest of the sum, from the date of the note to the time when it becomes due, including the days of grace; the interest thus found is reckoned the discount. Thus, if a note for 100 dollars, dated the 2d September, be discounted at a bank, for 30 days, the interest of that sum for 33 days, being 55 cents, is deducted for discount. It may be asked, why interest for 33 days is calculated on a note for 30: the answer is, that as custom has allowed the borrower three days of grace—that is, though the time of the note expires on the 1st of October, (the day of the date being included in the 30 days) he may withhold the payment till the 4th—it is therefore reasonable that he should pay interest for it.

If a note of 100 dollars were discounted at a bank for 60 days, the interest of that sum for 63 days, being 105 cents, would be deducted for the same reason.

In case payment of a note be not convenient at the proper time, a new note must be presented on the day of discount, immediately preceding the expiration of the time, paying the same discount or interest for the time, as before stated. Thus, a note of 100 dollars, dated October 7th, 1800, for 30 days, though it is not payable till November 8th, yet must be replaced by a new note on Tuesday, November 4th, paying at the same time 55 cents. A note of the same date, for 100 dols. for 60 days, though not payable till Monday, December 8th, (including in this time the days of grace) must be replaced by a new note on Tuesday, December 2d, pay-

ing likewise 105 cents. In the former case the borrower sustains a loss of 5 days in 30, and in the latter 7 days in 60 by renewing. All Banks have their stated times of discount, generally once in a week. In the preceding cases, the Bank is supposed to discount on Tuesday. Some Banks discount twice a week, others oftener.

The discount of any sum, discounted for 30 or 60 days, is found by multiplying it by one sixth of the days. [*See Interest, page* 98.]

EXAMPLES.

1. How much is the interest of 238 dols. discounted for 30 days?

238
,5½=⅙ of 33 days.
1190
119
1,30,9
Ans. 1 dol. 30 cts. 9 m.

2. What is the interest of 564 dols. discounted for 60 days?

564
1,0½=⅙ of 63 days.
5640
282
5,92,2
Ans. 5 dols. 92 cts. 2 ms.

What is the discount of the following sums, viz.

	dols.		*dols. cts. ms.*
3.	159	discounted for 30 days.	Ans. 0 87 4
4.	273	do.	1 50 1
5.	683	do.	3 75 6
6.	789	do.	4 33 9
7.	2194	do.	12 06 7
8.	219	discounted for 60 days.	Ans. 2 29 9
9.	187	do.	1 96 3
10.	319	do.	3 34 9
11.	658	do.	6 90 9
12.	2169	do.	22 77 4

13 How much is the discount of a debenture of 319 dols. payable in 210 days, discounting for 30 days?

NOTE. 28 days are allowed for a month, interest being calculated as if the note were renewable.

28)210(7 mo.
196

14 days.

319
,5½=1/8 of 33 days.

159 5
15 9

1,75,4 for 1 month.
7

12,27,8 for 7 months.
14 d. ½ mo. 87,7

13,15,5
Ans. 13 dols. 15 cts. 5 m.

14. What is the discount of the above sum, discounting for 60 days?

NOTE. As notes are renewable in 56 days, the interest of all securities is calculated accordingly.

56)210(3 discount months.
168

42 days.

319
1,0½=1/8 of 63 days.

3190
159

3,34,9 for 1 discount mo.
3

10,04,7 for 3 ditto.
28 d. ½ mo. 1,67,4
14 ¼ 83,7

12,55,8
Ans. 12 dols. 55 cts. 8 m.

The preceding examples shew the difference between discounting for 30 and 60 days.

2. A buys of B 4 hhds. of rum containing 410 gallons, at 1 dol. 17 cts. per gallon; and 253 lb. of coffee, at 21 cts. per lb. in part of which he pays 21 dollars in cash, and the balance in boards, at 4 dols. per thousand: how many feet of boards did the balance require? Ans. 127957½ feet.

3. B has C's note for 250 dols. with 6 months interest due on it, and to redeem it C delivers him 60 bushels of wheat at 7*s.* 6*d.* per bushel, 50 bushels of corn at 5*s.* 3*d.* per bushel, and the balance in staves at 30 dols. per thousand: what number of staves did B receive?

Ans. 5550 staves, or 4 m. 6 hun. and 10 casts.

4. B bought of D the hull of a schooner of 70 tons, at 16 dols. per ton, and paid him in cash 500 dols. 3 hhds. of molasses containing 350 gallons, at 64 cts. and is to pay the balance in New-England rum at 74 cts. per gallon: how many gallons is D to receive? Ans. 535$\frac{5}{37}$ gals.

5. A buys of B 250 quintals of fish, at 25*s.* per quintal; in payment B takes 100 dols. in cash, 2 hhds. of molasses containing 87 and 92 gals. at 3*s.* 8*d.* per gallon, 1 pipe of brandy containing 120 gals. at 7*s.* 6*d.* per gallon, and gives 3 months credit for the remainder; required the balance due, and what cash would pay it, allowing the interest of it for the time at 6 per cent. per annum, as discount for prompt payment?

Ans. Balance is 682 dols. 27 cts. 6 ms.=672,04,2 in cash.

6. C sells to D 28,674 feet of boards at 8 dols. 50 cts. per thousand, and takes in payment ⅓ cash, 4 barrels N. E. rum containing 123 gallons at 78 cts. per gallon, 1 barrel of sugar weighing neat 2 cwt. 2 qrs. 4 lb. at 10 dollars per cwt. and the balance in coffee at 25 cts. per lb.: how much money and coffee is C to receive?

Ans. 81 dols. 24 cts. 3 ms. and 149$\frac{39}{250}$ lb. of coffee.

7. C has nutmegs worth 7*s.* 6*d.* per lb. in ready money, but in barter he will have 8*s.*; D has tobacco worth 9*d.* per lb.: how much must he rate it per lb. that his profit may be equal to C's? Ans. 9$\frac{3}{5}$*d.*

8. A has tea which he barters with B. at 10*d.* per lb. more than it cost him, against cambrick which stands B in 10*s.* per yard, but he puts it at 12*s.* 6*d.*: I would know the first cost of the tea? Ans. 3*s.* 4*d.* per lb.

9. A has 240 bushels of rye, which cost him 90 cts. per bushel; this he barters with B at 95 cts. for wheat that stands B in 99 cts. per bushel: how many bushels of wheat

is he to receive in barter, and at what price is it to be rated, that their gains may be equal?

Ans. $218\frac{38}{200}$ bushels, at $104\frac{1}{2}$ cts. per bushel.

10. A and B barter some goods; A put his at $30\frac{6}{25}$ shillings, and gains 8 per cent. B puts his at $24\frac{3}{10}$ shillings, and gains at the same rate: what was the first cost of the goods? Ans. 28*s.* and 22*s.* 6*d.*

11. A and B barter; A has cloth that cost 28*d.* B's cost him 22*d.* and he puts it at 25*d.*: how high must A put his to obtain 10 per cent. more than B? Ans. 35*d.*

12. C and D barter; C of 7*s.* makes 6*s.* 8*d.* D, of 7*s.* 6*d.* makes 7*s.* 3*d.*: who has lost most, and by how much per cent.? Ans. C loses $1\frac{3}{7}$ per cent. more than D.

LOSS AND GAIN

Is a rule that discovers what is gained or lost in buying or selling goods, and instructs merchants and traders to raise or fall the price of their goods so as to gain or lose so much per cent. &c.

EXAMPLES.

1. Bought a piece of broadcloth containing 53 yards, at 4 dols. 65 cts. per yard, and sold at 5 dols. per yard: what is the profit on the whole?

		dols. cts.			
		5			
		4,65			
	yd.			*yds.*	
If	1	:	,35	::	53
					35
					265
					159
					18,55 Ans. 18 dls. 55 cts.

2. If 1 lb. of coffee cost 28 cts. and is sold for 31 cts. what is the profit on 3 bags, weighing 293 lbs. neat?

Ans. 8 dols. 79 cts.

3. Bought a piece of baize of 42 yards, for £4 14 6, and sold it at 2*s.* 6*d.* per yard: what is the gain or loss on the whole piece? Ans. 10*s.* 6*d.* gain.

4. A merchant bought 59 cwt. 3 qr. 14 lb. of iron, at 112 dols. per ton, paid freight and charges, 24 dols.: what is the gain or loss, if he sells the whole at 37*s.* 4*d.* per cwt.?
Ans. 13 dols. 26 cts. gain.

5. If a gallon of wine cost 6*s.* 8*d.* and is sold for 7*s.* 2*d.* what is the gain per cent.?

7 2
6 8

s.	*d.*			£.	
If 6	8	:	6	:: 100	Ans. 7½ per cent. gain.

6. When 20 per cent. loss is made on coffee, sold at 20 cts. per lb. what was the first cost? Ans. 25 cts.

7. At 13½ cts. profit on the dollar, how much is it per cent.?
Ans. 13½ per cent. or 13 dols. 50 cts. per 100 dols.

8. A trader sells his goods at 2½*d.* profit on the shilling, how much is it per cent.? Ans. 20⅚, or £20 16 8

9. Which is the better bargain, in purchasing fish, 17 shillings per quintal, and 4 months credit, or 16*s.* 8*d.* cash?
Ans. They are alike.

PROOF. The present worth of 17*s.* found by discount is equal to 16*s.* 8*d.* and 16*s.* 8*d.* with 4 months interest, will amount to 17*s.*

10. A bought a piece of shalloon, containing 34 yards, at 3*s.* 4*d.* per yard, and sold it at 12½ per cent. loss: how much did he sell it per yard? Ans. 2*s.* 11*d.*

11. Bought rum at 90 cts. per gallon: at what rate must it be sold to gain 20 per cent.? Ans. 108 cents.

12. A trader bought 1 hhd. of rum, of a certain proof, containing 115 gallons, at 1 dol. 10 cts. per gallon: how many gallons of water must he put into it to gain 5 dollars, by selling it at 1 dollar per gallon? Ans. 16½ gallons.

13. Bought 4 hhds. of rum, containing 450 gallons, at 1 dol. per gallon, and sold it at 1 dol. 20 cts. per gallon, and gave 3 months credit: now allowing the leakage of the rum while in my possession to be 10 gallons, I would know the gain or loss, discounting for the present worth of the debt at 6 per cent. per annum? Ans. 70 dols. 19 cts. gain.

14. A vintner buys 596 gallons of wine, at 6*s*. 3*d*. per gallon, in ready money, and sells it immediately at 6*s*. 9*d*. per gallon, payable in 3 months: how much is his gain or loss, supposing he allows the interest for the time, at 6 per cent. per annum, as discount for present payment?

Ans. £11 17 8 gained.

15. What would be the gain or loss on the aforesaid wine, supposing the discount for present payment to be made at 2 per cent. without any regard to time? Ans. £10 17 6½ gain.

16. A merchant bought a parcel of cloth at the rate of 1 dol. for every 2 yds. of which he sold a certain quantity at the rate of 3 dols. for every 5 yds. and then found he had gained as much as 18 yards cost; how many yards did he sell?

Ans. 90 yards.

17. Bought rum at 1 dol. 25 cts. per gallon, which not proving so good as I expected, I am content to lose 18 per cent. by it; how must I sell it per gallon? Ans. 1 dol. 2½ cts.

18. H sells a quantity of corn at 1 dollar a bushel, and gains 20 per cent.; some time after he sold of the same, to the amount of 37 dols. 50 cts. and gained 50 per cent.: how many bushels were there in the last parcel, and at what rate did he sell it per bushel?

Ans. 30 bushels, at 1 dol. 25 cts. per bushel.

19. A distiller is about purchasing 10,000 gallons of molasses, which he can have at 48 cents per gallon, in ready money, or 50 cents with 2 months credit: it is required to know which is more advantageous to him, either to buy it on credit, or to borrow the money at 8 per cent. per annum to pay the cash price?

Ans. He will gain 136 dols. by paying the cash.

20. A tobacconist buys 4 hogsheads of tobacco weighing 38 cwt. 2 qrs. 8 lb. gross, tare 94 lb. per hhd. at 9 dols. per cwt. ready money, and sells it at 11½*d*. per lb. allowing tare at 14 lb. per cwt. to receive two-thirds in cash, and for the remainder a note at 90 days credit: his gain or loss is required, supposing the note is discounted at a bank where discount is made for 60 days. Ans. 283 dols. 42 cts. 6 ms.

ALLIGATION MEDIAL

Is when the quantities and prices of several things are given, to find the mean price of the mixture compounded of those things.

RULE. As the sum of the quantities or whole composition is to their total value, so is any part of the composition to its mean price.

EXAMPLES.

1. A grocer would mix 25 lb. of raisins, at 8 cents per lb. and 35 lb. at 10 cents per lb. with 40 lb. at 12 cents per lb.: what is 1 lb. of this mixture worth?

	lb.		*cts.*		*cts.*
	25	at	8	-	200
	35	-	10	-	350
	40	-	12	-	480
	100				1030

	lb.		*cts.*		*lb.*
If	100	:	1030	::	1
			1		

1|00)10|30

cts. 10,3 Ans. 10 cents, 3 mills.

2. A goldsmith mixes 8 lb. 5½ oz. of gold, of 14 carats fine, with 12 lb. 8½ oz. of 18 carats fine what is the fineness of this mixture? Ans. $16\frac{5}{17}$ carats.

3. A grocer would mix 12 cwt. of sugar, at 10 dols. per cwt. with 3 cwt. at 8⅔ dols. per cwt. and 8 cwt. at 7½ dols. per cwt.; what will 5 cwt. of this mixture be worth?

Ans. 44 dols. 78 cts. 2 ms.

4. A refiner melts 2½ lb. of gold, of 20 carats fine, with 4 lb. of 18 carats fine; how much alloy must he put to it to make it 22 carats fine?

Ans. It is not fine enough by $3\frac{3}{11}$ carats, so that no alloy must be put to it, but more gold.

5. A malster mingles 30 quarters of brown malt, at 28*s.* per quarter, with 46 quarters of pale, at 30*s.* per quarter, and 24 quarters of high dried ditto, at 25*s.* per quarter: what is the value of 8 bushels of this mixture?

Ans. £1 8*s.* $2\frac{1}{2}\frac{3}{4}d.$

6. If I mix 27 bushels of wheat, at 5*s*. 6*d*. the bushel, with the same quantity of rye, at 4*s*. per bushel, and 14 bushels of barley, at 2*s*. 8*d*. per bushel; what is the worth of a bushel of this mixture? Ans. 4*s*. $3\frac{3}{4}d.\frac{3}{4}$.

7. A grocer mingled 3 cwt. of sugar, at 56*s*. per cwt. 6 cwt. at £1 17 4 per cwt. and 3 cwt. at £3 14 8 per cwt.; what is 1 cwt. of this mixture worth? Ans. £2 11 4

8. A mealman has flour of several sorts, and would mix 3 bushels at 3*s*. 5*d*. per bushel, 4 bushels at 5*s*. 6*d*. per bushel, and 5 bushels at 4*s*. 8*d*. per bushel; what is the worth of a bushel of this mixture? Ans. 4*s*. $7\frac{1}{4}d.\frac{4}{12}$.

9. A vintner mixes 20 gallons of Port, at 5*s*. 4*d*. per gallon, with 12 gallons of White wine, at 5*s*. per gallon, 30 gallons of Lisbon, at 6*s*. per gallon, and 20 gallons of Mountain, at 4*s*. 6*d*. per gallon; what is a gallon of this mixture worth?

Ans. 5*s*. $3\frac{3}{4}d.\frac{3}{4}$.

10. A farmer mingled 20 bushels of wheat, at 5*s*. per bushel, and 36 bushels of rye, at 3*s*. per bushel, with 40 bushels of barley, at 2*s*. per bushel: I desire to know the worth of a bushel of this mixture? Ans. 3*s*.

11. A person mixing a quantity of oats, at 2*s*. 6*d*. per bushel, with the like quantity of beans, at 4*s*. 6*d*. per bushel, would be glad to know the value of 1 bushel of that mixture?

Ans. 3*s*. 6*d*.

12. A refiner having 12 lb. of silver bullion of 6 oz. fine, would melt it with 8 lb. of 7 oz. fine, and 10 lb. of 8 oz. fine: required the fineness of 1 lb. of that mixture?

Ans. 6 oz. 18 dwt. 16 grs.

13. If with 40 bushels of corn, at 4*s*. per bushel, there are mixed 10 bushels, at 6*s*. per bushel, 30 bushels, at 5*s*. per bushel, and 20 bushels, at 3*s*. per bushel, what will 10 bushels of that mixture be worth? Ans. £2 3

ALLIGATION ALTERNATE

Is the method of finding what quantity of any number of simples, whose rates are given, will compose a mixture of a given rate; so that it is the reverse of Alligation Medial, and may be proved by it.

RULE. 1. Write the rates of the simples in a column under each other.

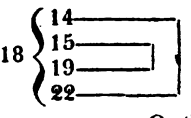
2. Connect or link with a continued line the rate of each simple, which is less than that of the compound, with one, or any number, of those that are greater than the compound, and each greater rate with one or any number of the less.

3. Write the difference between the mixture rate and that of each of the simples, opposite the rates with which they are linked.

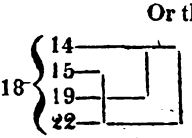
4. Then if only one difference stand against any rate, it will be the quantity belonging to that rate; but if there be several, their sum will be the quantity.

EXAMPLES.

1. A merchant would mix wines at 14*s*. 19*s*. 15*s*. and 22*s*. per gallon, so that the mixture may be worth 18*s*. the gallon: what quantity of each must be taken?



Or thus,



NOTE. Questions in this rule admit of a great variety of answers, according to the manner of linking them.

2. How much wine at 6*s*. per gallon, and at 4*s*. per gallon, must be mixed together, that the composition may be worth 5*s*. per gallon? Ans. 1 qt. or 1 gall. of each, &c.

3. How much corn, at 2*s*. 6*d*., 3*s*. 8*d*, 4*s*. and 4*s*. 8*d*. per bushel, must be mixed together, that the compound may be worth 3*s*. 10*d*. per bushel?

Ans. 12 at 2*s*. 6*d*., 12 at 3*s*. 8*d*., 18 at 4*s*. and 18 at 4*s*. 8*d*.

4. A goldsmith has gold of 17, 18, 22 and 24 carats fine; how much must he take of each to make it 21 carats fine?

Ans. 3 of 17, 1 of 18, 3 of 22, and 4 of 24.

5. It is required to mix brandy at 8*s*. wine at 7*s*. cider at 1*s*. and water together, so that the mixture may be worth 5*s*. per gallon.

Ans. 9 gals. of brandy, 9 of wine, 5 of cider, and 5 of water.

When the whole composition is limited to a certain quantity.

RULE. Find an answer as before by linking; then say, As the sum of the quantities, or differences thus determined, is to the given quantity, so is each ingredient found by linking to the required quantity of each.

EXAMPLES.

6. How many gallons of water must be mixed with wine worth 3s. per gallon, so as to fill a vessel of 100 gallons, and that a gallon may be afforded at 2s. 6d.?

$$30\left\{\begin{array}{l}0 \text{——} 6\\ 36 \text{——} 30\end{array}\right.$$

36

36 : 100 :: 6 — 36 : 100 :: 30

6 — 30

36)600(16 — 36)3000(83

36 — 288

240 — 120

216 — 108

24 — 12

Ans. $83\frac{1}{3}$ gallons of wine, and $16\frac{2}{3}$ of water.

7. A grocer has currants at 4*d*., 6*d*., 9*d*. and 11*d*. per lb. and he would make a mixture of 240 lb. so that it might be afforded at 8*d*. per lb. how much of each sort must he take?

Ans. 72 lb. at 4*d*., 24 at 6*d*., 48 at 9*d*., and 96 at 11*d*.

8. How much gold of 15, of 17, of 18, and of 22 carats fine, must be mixed together, to form a composition of 40 oz. of 20 carats fine?

Ans. 5 oz. of 15, of 17, and of 18, and 25 oz. of 22.

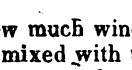
When one of the ingredients is limited to a certain quantity.

RULE. Take the difference between each price and the mean rate, as before; then,

As the difference of that simple, whose quantity is given, is to the rest of the differences severally, so is the quantity given, to the several quantities required.

EXAMPLES.

9. How much wine, at 5*s*. at 5*s*. 6*d*. and at 6*s*. the gallon, must be mixed with three gallons, at 4*s*. per gallon, so that the mixture may be worth 5*s*. 4*d*. per gallon?



8+2=10
8+2=10
16+4=20
16+4=20

10 : 10 :: 3 : 3
10 : 20 :: 3 : 6
10 : 20 :: 3 : 6

Ans. 3 gallons at 5*s*., 6 at 5*s*. 6*d*. and 6 at 6*s*.

10. A grocer would mix teas at 12*s*., 10*s*. and 6*s*. with 20 lb. at 4*s*. per lb.—how much of each sort must he take to make the composition worth 8*s*. per lb.?

Ans. 20 lb. at 4*s*., 10 lb. at 6*s*., 10 lb. at 10*s*. and 20 lb. at 12*s*.

11. How much gold of 15, of 17, and of 22 carats fine, must be mixed with 5 oz. of 18 carats fine, so that the composition may be 20 carats fine?

Ans. 5 oz. of 15 carats fine, 5 oz. of 17, and 25 of 22.

POSITION

Is a rule, which, by false or supposed numbers, taken at pleasure, discovers the true one required. It is divided into two parts, SINGLE and DOUBLE.

SINGLE POSITION

Is, by using one supposed number, and working with it as the true one, you find the real number required, by the following

RULE. As the total of the errors is to the given sum, so is the supposed number to the true one required.

PROOF. Add the several parts of the result together, and if it agrees with the given sum, it is right.

EXAMPLES.

1. A schoolmaster, being asked how many scholars he had, said, If I had as many, half as many, and one quarter as many more, I should have 264: how many had he?

Suppose he had 72
As many - - 72
$\frac{1}{2}$ as many - - 36
$\frac{1}{4}$ as many - - 18

As 198 : 264 :: 72

72

528
1848

198)19008(96 Answer.
1782

1188
1188

Proof.
96
96
48
24

264

2. A person, after spending $\frac{1}{3}$ and $\frac{1}{4}$ of his money, had 60 dollars left; what had he at first? Ans. 144 dols.

3. A certain sum of money is to be divided between 4 persons, in such a manner, that the first have $\frac{1}{3}$ of it, the second $\frac{1}{4}$, the third $\frac{1}{5}$, and the fourth the remainder, which is 28 dollars; what was the sum? Ans. 112 dols.

4. A person lent his friend a sum of money unknown, to receive interest for the same, at 6 per cent. per annum, simple interest, and at the end of 5 years he received for principal and interest 644 dollars 80 cents; what was the sum lent? Ans. 496 dols.

DOUBLE POSITION

Is by making use of two supposed numbers, which, if both prove false, are, with their errors, to be thus disposed:

RULE. 1. Place each error against its respective position.

2. Multiply them crosswise.

3. If the errors are alike, that is, both greater or both less than the given number, divide the difference of the products

by the difference of the errors, and the quotient is the answer: but if the errors be unlike, divide the sum of the products by the sum of the errors, and the quotient will be the answer.

EXAMPLES.

1. B asked C how much his horse cost; C answered, that if he cost him three times as much as he did, and 15 dollars more, he would stand him in 300 dollars: what was the price of the horse?

	dols.		*dols.*
Suppose he cost	90	Suppose he cost	96
	3		3
	270		288
	15		15
	285 too little by 15 dls.		303 too much by 3.

90 15—

X

96 3+

15	1440	270
3	270	
Sum of the errors 18)	1710(95 answer.	95
	162	3
	90	285
	90	15
		300 proof.

2. Two persons, A and B, have both the same income; A saves one-fifth of his yearly; but B, by spending 150 dollars per annum more than A, at the end of 8 years finds himself 400 dollars in debt: what is their income, and what does each spend per annum?

Ans. Their income is 500 dollars per annum; also A spends 400, and B 550 dollars per annum.

3. There is a fish whose head is 9 inches long, and his tail is as long as his head and half his body, and his body is as long as the head and tail: what is the whole length of the fish? Ans. 6 feet,

4. Divide 15 into two such parts, so that when the greater is multiplied by 4, and the less by 16, the products will be equal. Ans. 12 and 3.

5. A man had two silver cups of unequal weight, having one cover to both, 5 oz.; now if the cover is put on the less cup it will be double the weight of the greater cup, and put on the greater cup it will be three times as heavy as the less cup: what is the weight of each cup?

Ans. 3 oz. less, 4 oz. greater.

6. A person being asked in the afternoon, what o'clock it was, answered, that the time past from noon was equal to $\frac{2}{13}$ of the time to midnight; required the time.

Ans. 36 minutes past one.

EXCHANGE

Is the paying of money in one place or country, for the like value to be received in another place or country.

There are two kinds of money, viz. Real and Imaginary.

Real Money is a piece of metal coined by the authority of the State, and current at a certain price, by virtue of the said authority, or of its own intrinsic value.

Imaginary money is a denomination used to express a sum of money of which there is no real species, as a *livre* in France, a *pound* in America, because there is no species current, in this or that country, precisely the value of either of the sums.

Par of Exchange is the intrinsic value of the money of one country compared with that of another country, as one pound sterling is equal to thirty-five shillings Flemish.

Course of Exchange is the current or running price of exchange, which is sometimes above and sometimes below par, varying according to the occurrences of trade, or demand for money. Of this course, there are tables published daily in commercial cities: thus by Lloyd's List, of 3d December, 1799, the course of Exchange between Hamburgh and London, was 32*s.* 6½*d.* Flemish, per pound sterling, being 2*s.* 5½*d.* under par, or loss to London.

GREAT-BRITAIN.

The money of account is Pounds, Shillings, Pence and Farthings.

The English Guinea is 21 shillings, sterling.

Weights and measures generally as in the United States.

The United States dollar is equal to 4*s.* 6*d.* sterling.

To change Sterling to Federal money.

RULE. Annex three cyphers to the sum (if pounds only) and multiply it by 4; this product divide by 9, and you have the answer in cents. If there be shillings, &c. the usual method is to reduce it to Massachusetts money, by adding one third to it, and then reduce this sum to Federal.

EXAMPLES.

1. Change £.48 Sterling to Federal.

48000
4

9)192000

21333⅓ cents. Ans. 213 dols. 33⅓ cts.

2. Change £.389 17 4½ Sterling to Federal, exchange at 33⅓ per cent. that is, £.133⅓ Massachusetts for £.100 Sterling.

⅓)389 17 4½ Sterling
129 19 1½ Exchange

519 16 6 Massachusetts

,3)519,825

cts. 173275 Federal. Ans. 1732 dols. 75 cts.

NOTE. Sterling is changed to Massachusetts money by adding one third to the sum, and Massachusetts to Sterling by deducting one fourth from it.

To change Federal Currency to Sterling.

RULE. Work by either of the following methods.

EXAMPLES.

1. Change 1732 dollars 75 cts. to sterling.

First method.

	1732		
4s. $\frac{1}{5}$	346	8	
6d. $\frac{1}{8}$	43	6	
50 cents		2	3
25 cents		1	$1\frac{1}{2}$
Ans.	£.389	17	$4\frac{1}{2}$

Second metho

1732,'

519|8

16|5

6|0

$\frac{1}{4}$)519 16 6 Massachusetts.
129 19 $1\frac{1}{2}$ Exchange.

Ans. £.389 17 $4\frac{1}{2}$ Sterling.

2. What is the Federal amount of an invoice of goo charged at £.196 14 6 Sterling, advancing on it 25 per c

25 $\frac{1}{4}$)196 14 6 Sterling.
49 3 $7\frac{1}{2}$ Advanco.

245 18 $1\frac{1}{2}$

Exchange at $33\frac{1}{3}$ per cent. 81 19 $4\frac{1}{2}$

£.327 17 6 Massachusetts.

3)327875

cts. 1092912/3 Ans. 1092 dls. $91\frac{2}{3}$ c

3. The Sterling cost of certain goods being £.60 12 what does it amount to in Massachusetts money, advanci on it 50 per cent.?

	60	12	6
50 per cent. advance	30	6	3
	90	18	9
Exchange at $33\frac{1}{3}$ per cent.	30	6	3
Ans.	£.121	5	0 Massachusetts mone

The mercantile method, with 50 per cent. advance, is to double Sterling for Massachusetts money, thus,

60 12 6 Sterling.
2

£.121 5 0 Massachusetts, as above.

4. An invoice of goods, charged at £.52 19 7 sterling, is sold at 75 per cent. advance on the sterling cost: how much is it in Massachusetts money?

	52	19	7
Advance at 50	26	9	$9\frac{1}{2}$
25	13	4	$10\frac{3}{4}$
	92	14	$3\frac{1}{4}$
Exchange at $33\frac{1}{3}$ per cent.	30	18	1

Ans. £.123 12 $4\frac{1}{4}$ Mass money.

The mercantile method, with 75 per cent. advance, is to multiply the sterling by $2\frac{1}{3}$ for Massachusetts money.

Thus, 52 19 7

$2\frac{1}{3}$

105	19	2
17	13	$2\frac{1}{4}$

Ans. £.123 12 $4\frac{1}{4}$ Mass. money, as above.

5. The sterling cost of certain goods being £.214 11 6, how much is it in Federal money, advancing thereon 60 per cent?

		214	11	6	
50	$\frac{1}{2}$	107	5	9	} advance.
10	$\frac{1}{5}$	21	9	$1\frac{3}{4}$	}
		343	6	$4\frac{3}{4}$	
Exchange	$\frac{1}{3}$	114	8	$9\frac{1}{2}$	
		457	15	$2\frac{1}{4}$	Massachusetts.

Or thus, 214 11 6 Sterling.

Exchange	$\frac{1}{3}$	71	10	6	
		286	2	0	
50	$\frac{1}{2}$	143	1	0	
10	$\frac{1}{5}$	28	12	$2\frac{1}{4}$	
		457	15	$2\frac{1}{4}$	Massachusetts.

3)457,759

dollars 1525,86$\frac{1}{3}$ Ans. 1525 dols. 86$\frac{1}{3}$ cts.

6. What is the amount of a bill of exchange of £.115 14 9 sterling, sold in Boston at 1½ per cent. advance?

½)115	14	9	Sterling.	
38	11	7	Exchange.	
154	6	4	Massachusetts money.	

3)154,317

514,39 Federal.

1½

51439
25719

cents 771|58

	dols.	*cts.*
Value at par	514	39
Advance	7	71½
Amount	522	10½

	dols.	*cts.*		
Or thus, Value at par	514	39		
Advance at 1 per ct.	5	14	3	
½ do.	2	57	1	
	7	71	4	Adv. at 1½ per ct.
Amount	522	10	4	

7. A merchant in Boston receives a parcel of goods from London, charged in the invoice at the following prices, and marks them for sale at 60 per ct. advance on the sterling cost; required the selling price of each in Massachusetts money?

s.	*d.*		*s.*	*d.*		*dols.*	*c.*	*m.*
13	8	sterling, adv. 60 per ct.	29	1½	Mass. money, or	4	85	3
5	10	- - - -	12	5½	- -	2	7	3
3	4	- - - -	7	1¼	- -	1	18	3
6	1½	- - - -	13	0¾	- -	2	17	6
17	0	- - - -	36	3¼	- -	6	4	6
33	1	- - - -	70	6½	- -	11	75	6
1	2	- - - -	2	5½	- -		41	
18	10	- - - -	40	2	- -	6	69	4
11		- - - -	23	5½	- -	3	91	
2	4	- - - -	4	11¼	- -		82	3
32	3	- - - -	68	9½	- -	11	46	6
27	9	- - - -	59	2¼	- -	9	86	3

8. A watch that cost 15 guineas in London, was sold in Boston at 50 per cent. advance on the sterling cost; what was the price?

15 guineas=£.15 15 0 Sterling.
2

31 10 0 Massachusetts.

3)31,5

Ans. 105 dollars.

9. How much is the premium of insuring £.294 at 8 guineas per cent.? Ans. £ 24 13 11 sterling.

MERCANTILE METHODS OF CALCULATING, VIZ.

At 25 per cent. discount from the sterling cost, multiply it by 1 for the answer in Massachusetts money.

10	$1\frac{1}{9}$
par	$1\frac{1}{3}$
$12\frac{1}{2}$ per ct. adv. on the sterl. cost, multiply it by	$1\frac{1}{2}$
25	$1\frac{2}{3}$
$31\frac{1}{4}$	$1\frac{3}{4}$
50	2
$62\frac{1}{2}$	$2\frac{1}{6}$
65	$2\frac{1}{5}$
75	$2\frac{1}{3}$
$87\frac{1}{2}$	$2\frac{1}{2}$
100	$2\frac{2}{3}$
125	3
140	$3\frac{1}{5}$
150	$3\frac{1}{3}$
$162\frac{1}{2}$	$3\frac{1}{2}$
175	$3\frac{2}{3}$
200	4

IRELAND.

The money of account as in England, but different in value. The par between England and Ireland is $8\frac{1}{3}$ per cent. that is, £.100 sterling money is £.108 6 8 in Ireland.

Mercantile weights and measures, the same as in England.

The United States dollar is equal to 4*s*. $10\frac{1}{2}$*d*. Irish.

The English guinea is equal to 22*s*. 9*d*. Irish.

To reduce Irish money to Federal.

RULE: Reduce the given sum to half pence, annex two cyphers to it, and then divide by 117, (the half pence in a dollar) and the quotient is the answer in cents. Or reduce the Irish to Sterling, by deducting $\frac{1}{13}$ from it, and then work as for Sterling.

EXAMPLE.

Change £.278 15 9 Irish money to Federal.

First method.	Second method.
278 15 9	$\frac{1}{13}$)278 15 9 Irish.
20	21 8 11 Exchange.
5575	257 6 10 Sterling.
12	85 15 7¼
66909	343 2 5¼ Mass.
2	
9)13381800	,3)343,122
9×13=117	1143,74 cents.
13)1486866	
114374 cents.	Ans. 1143 dols. 74 cts.

To change Federal money to Irish.

RULE. Multiply the given sum by 117, reject two figures from the product to the right hand, and the remaining figures are the half pence in the given sum.

1. Change 1143 dols. 74 cts. to Irish.

114374
117
800618
114374
114374
2)133817|58
12)66908¾
2|0)557|5 8
Ans. £.278 15 8¾

If the sum is dollars only, work by either of the following methods.

2. Change 1537 dollars to Irish.

First method. 1537 at 4s. 10½d.					Second method. 1537			
					,3			
4s.	⅓	307	8					
8d.	⅙	51	4	8	461	2		Massachusetts.
2	¼	12	16	2	¼ 115	5	6	Exchange at 25 per ct.
½	¼	3	4	0½				
					345	16	6	Sterling.
Ans.		£.374	12	10½	1/12	28	16	4½ Ex. 8⅓ p. ct. or 1d. on 1s.
					£.374	12	10½	

In changing Sterling to Irish money at par, 1/12 is added to the sum for Irish; and in changing Irish to Sterling, 1/13 is deducted for Sterling because 12 pence English are equal to 13 pence Irish, making the Exchange 1d. in a shilling, 1s. 8d. in a pound, and £.8 6 8 per cent.

EXAMPLES.

1. Change £.394 17 6 Sterling to Irish, at par, or £.8⅓ per cent.

1/12)394 17 6
32 18 1½

Ans. £.427 15 7½ Irish.

2. Change £.427 15 7½ Irish money to Sterling, at 8⅓ per cent. in favour of England.

1/13)427 15 7½
32 18 1½

Ans. £.394 17 6 Sterling.

3. Change £.370 Sterling to Irish at 9 per cent.

£. £. £.
100 : 109 : : 370 Ans. £.403 6 0

4. Reduce £.403 6 Irish money to Sterling, at 9 per cent.

9
100

109 : 100 : : £. 403 s. 6 Ans. £.370

HAMBURGH.

Accounts are kept in Hamburgh in Marks, Shillings Lubs or Stivers, and Deniers.

12 deniers, or 2 grotes, make 1 shilling lubs, or stiver.
16 shillings lubs, stivers, or 32 grotes - - - } 1 mark.

Also,

12 grotes or pence Flemish make 1 shilling Flemish.
20 shillings Flemish - - 1 pound.

NOTE.	3 marks -	make -	1 rix dollar.
	7½ do. - -	-	1 pound Flemish.
	A shippound in Hamburgh	-	280 lb.
	A ring of staves do.	-	240
	100 lb. in Hamburgh	-	107¼ lb. in U. States.
	100 ells do.	- -	62½ yards.

The currency of Hamburgh is inferior to the bank money; the *agio*, or rate, is variable; May 14th, 1798, it was 20 per cent in favour of the bank.

The mark banco is 33⅓ cents. (See laws of the U. States.)

EXAMPLES.

1. Change 12843 marks to Federal, at 33⅓ cents per mark.

$33\frac{1}{3}=\frac{1}{3})12843$

Ans. 4281 dollars.

2. In 4967 marks 8 stivers banco, how many dollars, exchange as above?

$33\frac{1}{3}=\frac{1}{3})4967,$

$1655,66\frac{2}{3}$
8 stivers $,16\frac{2}{3}$

dols. $1655,83\frac{1}{3}$

Ans. 1655 dols. 83⅓ cts.

To change Hamburgh money to Sterling.

RULE. As the given rate is to one pound, so is the Hamburgh sum to the sterling required.

EXAMPLES.

1. Change 2443 marks 9½ stivers to Sterling, exchange at 32*s.* 6*d.* Flemish per pound Sterling.

s.	*d.*		£.		*m.*	*st.*
32	6	:	1	: :	2443	9½
12 grotes.					32	2
390					4886	19 grotes.
					7329	
					19	
					78195	
					1	

390)78195(200£.
780

195
20

390)3900(10*s.*
3900

Ans. £.200 10 0

2. In 12093 marks 12 stivers, how many pounds sterling, exchange at 32*s.* 3*d.* Flemish per pound Sterling?
Ans. £.1000

3. In 4178 marks 2 stivers, how many pounds Sterling, exchange at 31*s.* 10*d.* Flemish per pound Sterling?
Ans. £.350

4. Change 1971 marks 13 stivers to Sterling, exchange at 35*s.* 6*d.* Flemish per pound Sterling. Ans. £.148 2 4

To change Sterling to Hamburgh money.

RULE. As 1 pound Sterling is to the given rate, so is the Sterling sum to the Hamburgh required.

EXAMPLE.

Change £350 Sterling to Hamburgh money, exchange at 31*s.* 10*d.* Flemish per pound Sterling.

£.	*s.*	*d.*		£.
1	: 31	10	: :	350
	12			
	382 grotes.			
	350			
	19100			
	1146			
	2)133700 grotes.			
	16)66850 stivers.			
	4178 2			Ans. 4178 marks 2 stivers.

Proving the answers in the preceding case will further exemplify this.

To reduce Current to Bank money.

RULE. As 100 marks with the agio added, is to 100 bank, so is the current money to the bank required.

EXAMPLES.

1. Change 560 marks 8 stivers current to banco, agio at 18 per cent.

18
100

118 : 100 : : 560 8. Ans. 475 marks.

2. Change 2366 marks current to banco, agio at 20 per cent. Ans. 1971 marks, $10\frac{4}{5}$ stivers.

3. Change 7456 current marks to banco, agio at 22 per cent. Ans. 6111 marks, 7 stivers.

To change Bank to Current money.

RULE. As 100 marks is to 100 with the agio added, so is the bank given to the current required.

EXAMPLES.

1. Change 475 marks banco to current, agio at 18 per ct.

18
100

m.		*m.*
100	: 118 : :	475

Ans. 560 marks, 8 stivers.

Or thus,

475		
18	475	bank.
	85 8	agio.
3800		
475	560 8	as above.
85\|50		
16		
8\|00		

2. Change 1971 marks, 10⅔ stivers banco to current, agio at 20 per cent.

	m.	*s.*	
20 ⅕)1971	10⅔		banco.
	394	5⅓	agio.
Ans.	2366	0	current.

PRACTICAL QUESTIONS.

1. How much will 63452 lb. of cotton come to, at 8 grotes per lb.?

lb.		*gr.*		*lb.*
1	:	8	: :	63452
				8
				2)507616 grotes.
				16)253808 stivers.
			Ans.	15863 marks.

2. What will 351 lb. of cotton come to at 50*d.* per lb.?

NOTE. *d.* is the mark for pence Flemish, equal in value to half stivers or half shillings lubs.

lb.		*d.*		*lb.*
1	:	50	: :	351
				50

2)17550 grotes, or pence Flemish.

16)8775 stivers.

548 7 Ans. 548 marks 7 stivers.

3. What will 339 bars Russian iron come to, wt. 19662 lb. at 35½ marks per shippound?

lb.		*m.*		*lb.*
280	:	35½	: :	19662

Ans. 2492 m. 14 stiv.

			m.	*st.*
4.	280 lb. of cotton - at	21 grotes per lb. -	183	12
5.	4002¼ lb. coffee - -	8½ stivers - -	2063	10
6.	2488 pipe staves - -	16 marks per ring of 240	162	9
7.	3540 hhd. do. - -	8½ do. do. -	125	6
8.	529 barrel do. - -	5½ do. do. -	11	9
9.	1790 lb. sugar - -	21½ pence per lb. -	1188	10
10.	4892 lb. rice - -	18½ marks per 100 -	892	12
11.	4 pieces 10-4 bedtick -	24 do. - -	96	0
12.	140 half pint tumblers -	8 do. per 100	11	3
13.	100 boxes window glass -	23 do per box -	2300	
14.	1526½ lb. coffee -	16½ stivers per lb. -	1574	3
15.	245 bars iron, wt. 8434 lb.	41 marks per shippound	1235	
16.	10 bales hemp, wt. 14108 lb.	74 do. do. -	3723	

17. What is the commission on 18270 marks, at 2½ per cent? Ans. 456 m. 12 st.

18. What is the interest of 6370 marks, for 3 months, at 5 per cent. per annum? Ans. 79 m. 10 st.

19. Change 5955 marks 7½ stivers to Dutch florins, at 38½ grotes per florin.

	m.	*st.*
	5955	7½
grotes in a mark=32		2 grotes a stiver.
	11910	15 grotes in 7½ stivers.
	17865	
	15	
grotes 38½	190575	grotes.
2	2	
77)	381150 (	4950 gilders.
	308	
	731	
	693	
	385	
	385	

Ans. 4950 gild. or flor.

20. An American merchant orders his correspondent in Amsterdam to remit 4980 florins 16½ stivers to Hamburgh; this being done, when the exchange is 39¼ stivers for 2 marks, what sum is he credited for in Hamburgh?

st.	*m.*	*fl.*	*st.*
39¼	: 2 : :	4980	16½
4		20	
157		99616½	
		2	
		199233	
		4	
		157)796932(5076 marks.	
		785	
		1193	
		1099	
		942	
		942	

Ans. 5076 marks.

HOLLAND.

Accounts are kept in Florins or Gilders, Stivers, Deniers or Pennings.

8 pennings	make	1 grote.
2 grotes, or 16 pennings		1 stiver.
20 stivers, or 40 grotes		1 gilder or florin

Also,

12 grotes, or 6 stivers		1 shilling.
20 shillings, or 6 gilders		1 pound Flemish
2½ florins		1 rix dollar.

The florin or gilder of the United Netherlands is estimated in the United States at 40 cents. or 2 cents per stiver.

100 lb. in Amsterdam make 109½ lb. in the United States.
100 ells do. 75 yards do.

In liquid measure, 16 mingl s make 1 stockan.
8 stockans - 1 aum.

EXAMPLES.

1. Change 1954 florins to Federal money at 40 cts. pr. florin.

1954
40

dols. 781,60 Ans. 781 dols. 60 cts.

2. Change 2653 gilders 17 stivers, to Federal money, at 40 cents per gilder.

2653 17
40 2

106120 34
34

106154 cts.

Or thus, 2653 17
20

53077 stivers.
2 cts. per stiver.

1061,54
Ans. 1061 dols. 54 cents.

3. Change 1061 dols. 54 cts. to gilders, at 40 cts. per gilder.

2)106154 cents.

2|0)5307|7 stivers.

2653 17 Ans. 2653 gild. 17 stiv.

3. What must be paid in Boston for an invoice of goods charged at 591 florins 17 stivers; allowing the exchange at 40 cents per florin, or 2 cents per stiver, and advancing on it 60 per cent?

591 17
20

11837 stivers.
2

dols. 236,74
60 per cent.

142,0440

	dols.	*cts.*
am. of invoice	236	74
advance	142	04
Ans.	378	78

To change Sterling to Flemish.

RULE. As 1 pound sterling is to the given rate, so is the sterling given to the Flemish required.

EXAMPLE.

1. In £.100 10*s.* sterling, how many gilders, exchange at 33*s.* 9*d.* Flemish per pound sterling?

£.		*s.*	*d.*		£.	*s.*
1	:	33	9	: :	100	10
20		12			20	
20		405 grts.			2010	
					405	
					10050	
					80400	
					2\|0)81405,0	
					2)40702½ grotes.	
					2\|0)2035\|1¼ stivers.	
					1017 11¼	

Ans. 1017 gild. 11¼ stiv.

To change Flemish to Sterling.

RULE. As the given rate is to £.1 sterling, so is the Flemish given to the sterling required.

EXAMPLE.

Change 1017 gilders 11½ stivers to sterling, exchange at 33*s.* 9*d.* Flemish per pound sterling.

s.	*d.*		£.		*fl.*	*st.*
33	9	:	1	: :	1017	11½
12					40	2
405 grotes.					40680	22½
					22½	

405)40702½(100
405

202½
20

405)4050(10
4050

Ans. £.100 10

To change Current money to Bank.

RULE. As 100 gilders with the agio added is to 100 bank, so is the current money given to the bank required.

EXAMPLE.

Change 823 gilders 9½ stivers current money into bank, agio at 4½ per cent.

g.		*g.*		*g.*	*s.*
104½	:	100	: :	823	9½
20				20	
2090				16469½	
				100	

2090)1646920(788 gilders.

To change Bank money into Current.

RULE. As 100 gilders bank is to 100 with the agio added, so is the bank money given to the current required.

EXAMPLE.

Change 788 gilders bank money to current, agio at 4½ per cent,

g.		*g.*		*g.*	
100	:	104½	: :	788	Ans. 823 gilders, 9½ stiv.

PRACTICAL QUESTIONS.

1. What will 1867 lb. of coffee come to, at 19 stivers pr. lb.?

1867
19
16803
1867
2|0)3547|3 stivers.
1773 13 Ans. 1773 gilders, 13 stivers.

2. What will 92 hhds. of sugar come to, weighing 104242 lb. gross, deducting 2 per cent. for good weight, tare 18 per cent. at 21 grotes per lb.?

104242
deduct 2 per cent. 2085
102157
tare 18 per cent. 18388
83769 neat wt.
21
83769
167538
2)1759149 grotes.
2|0)87957|4½ stivers.
43978 14½ Ans. 43978 gilders 14½ stivers.

3. What will 251 bars of iron come to, weighing gross 10364 lb. at 9¾ gilders per 100 lb. deducting 2 per cent.?

10364
9¾
93276
5182
2591
1010,49
20
9,80
16
12,80

2 per cent. = $\frac{1}{50}$)1010 g. 9 s. 12 p.
20 4 3
Ans. 990 5 9

4. What will 143 steckans 2 mingles of brandy come to, at 42 gilders per aum?

8)143

17 7 2
42

34
68

4 steckans	½	21		
2 do.	¼	10	10	
1 do.	⅛	5	5	
2 ming.	1/16	0	13	2
		751	8	2

Ans. 751 gild. 8 stiv. 2 penningr.

			gild.	st.
5.	21315 lb. of sugar	23 grotes per lb.	12256	2
6.	56560	25	35350	
7.	27093	25½	17271	15
8.	8189 lb. of coffee	23⅛ stivers	9622	1
9.	4650	23¼	5405	12
10.	1970	19¼	1945	7
11.	39285	21¼	41740	6
12.	212 ells linen, 208 payable	30	312	
13.	4190 lb. butter	13 gild. per 40 lb.	1361	15
14.	6476	11 1-2	1861	17
15.	2012 lb. lead	13 1-2 do. per 100 lb.	271	12
16.	214 stec. 11 min. brandy	42 do. per aum	1127	2

DENMARK.

Accounts are kept in Danish current dollars and skillings, reckoning 96 skillings to the dollar.

The course of exchange on London in September, 1799, was 5 rix or Danish dollars for 1 pound sterling.

The rix dollar of Denmark is estimated at 100 cents—(*See Laws of the United States.*)

96 pounds of Denmark make 100 pounds in the U. States.

Their weights are shippounds, lispounds and pounds.

16 pounds	make	1 lispound.
20 lispounds, or 320 pounds		1 shippound.

EXAMPLES.

1. How much will 8 pieces of platillas come to, at 9 dols. 56 skillings per piece?

9 56
8

76 64 Ans. 76 dols. 64 skills.

2. How much will 1418 bars of iron come to, weighing 263 shippounds 9 lispounds and 4 pounds, at 15 dols. per shippound.

lb. *d.* *s.* *lis.lb.*
320 : 15 : : 263 9 4
20
5269
16
31618
5269
84308
15
32|0)126462|0)3951
96
304
288
166
160
62
32
30
96
32)2880(90
2880

Or,

ship.
263
15
lis. 3945
5 $\frac{1}{4}$ 3 72
4 $\frac{1}{5}$ 3 00
5 *lb.* $\frac{1}{16}$ 0 18
Ans. 3951 90

Ans. 3951 dols. 90 skills.

3. What is the commission on 21545 Danish dols. 13 skills. at 2 per cent.?

21545 13
2
430,90 26
96
566
810
86,66

Ans. 430 dols. 86 skills.

4. What will 4 hhds. of sugar come to, weighing gross 4314 lbs. tare 17 per cent. at 22 skillings per lb. ?

Ans. 820 dols. 62 skills.

			dls. sks.		*dls. sks.*
5.	4 pieces table cloth	- -	3 80	- - -	15 32
6.	50 do.	- - - - -	9 56	- -	479 16
7.	13 do.	- - - - -	17 64	- - -	229 64
8.	24 do.	- - - - -	12	- - -	288 00
9.	50 do.	- - - - -	15	- - -	750 00
10.	100 coils cord, wt. 62*sk.* 16*l.* 2*lb.*		30 per shipp'd		1884 18
11.	85 bun. ch. hemp, 250	- - -	36	- - - -	9000 00
12.	1951 bars Rus. iron, 362 8 10		14	- -	5074 3

13. How many Danish dollars will be received in Copenhagen for a bill of £.2300 on London, exchange at 5 rix dollars per pound sterling ? Ans. 11500 dols.

14. A bill is drawn in Copenhagen for 18574 marks 7 stivers, Hamburgh money, when the exchange is 128 Danish dollars for 100 rix dollars in Hamburgh : how many Danish dollars does it amount to ?

NOTE. Three marks are equal to 1 rix dollar.

m.	*r.d.*		*m.*	*st.*		*r.d.*	*sk.*
If 3	: 1	: :	18574	7	:	6191	46
r.d.	*D.d.*			*r.d.*	*sk.*		
If 100	: 128	: :		6191	46		

Ans. 7925 D. dls. 6 sk.

Or thus. 3)18574 7 Hamburgh money.

6191 46

28 per cent. 1733 56

7925 6 Danish money, as above.

BREMEN.

Accounts are kept in Rix Dollars and Grotes, reckoning 72 grotes to the rix dollar, which is equal to 2¼ marks.

On the 29th November, 1795, the exchange on London was 551 rix dollars for £.100 sterling.

In 1802, the course of exchange on the United States was 75 cents per rix dollar.

The Bremen last is equal to 80 bushels in the U. States.

100 lb. in Bremen are equal to 110 lb. in the U. States.

EXAMPLES.

1. What will 1104 lb. of coffee come to, at 32¾ grotes per lb.?

1104
32¾
2208
3312
552
276
r.d. grotes.
72)36156(502 12
360
156
144
12 Ans. 502 rix dollars, 12 grotes.

2. What is the commission on 7621 rix dollars, 6 grotes, at 3½ per cent. Ans. 266 rix dols. 53 grotes.

			r. dls.	gr.
3.	3071 lb. coffee at	32¾ grotes per lb. -	1396	63
4.	400 - - -	32¾ - - - - - - -	181	18
5.	706 - - -	33½ - - - - - - -	328	35
6.	31407 lb. sugar	15¾ - - - - - -	6870	20

ANTWERP.

Accounts are kept in Antwerp in Gilders, Shillings and Grotes.

12 grotes - - - - - - make - 1 shilling.
3½ shillings, or 40 grotes - - - - 1 gilder.

The Braband or Antwerp grotes are of the value of the cents of the United States, a gilder being reckoned at 40 cents. In the current money of Antwerp they have stivers of the value of the stiver of Amsterdam, or 2 cents United States currency.

100 pots Braband = 36½ gallons United States.
96 lb. Antwerp = 100 lb. do.
100 Braband ells, about 74 yards American.

The new quintal of Antwerp consists of 10 myriagrammes or 204 lb. 14 oz. Avoirdupois weight.

The loss on sugar exported from America to Antwerp is 22½ per cent. viz. tare 14 lb. per 100 lb.—good weight 2 lb.—loss of weight 5 lb.—discount 1½ lb. equal to 22½ lb. per 100 lb.

Loss on cotton 12½ per cent.—on coffee in bags 11½ pr. ct.

EXAMPLES.

1. A cargo consisting of 48 hhds. sugar, weighing 376 cwt. 1 qr. 14 lb. valued per invoice at 12 dols. per cwt. and 63 bags coffee weighing 7345 lb. at 32 cents per lb. is sold in Antwerp; what sum was received for it, in gilders and grotes, at 40 cents per gilder, allowing the customary deductions for tare, &c. at an advance of 33⅓ per cent. from the invoice?

	cwt.	*qr.*	*lb.*		*lb.*
	376	1	14		7345
Tare, &c. 22½ per ct.	84	2	20½	Tare, &c. 11½ pr. ct.	844½
Neat	291	2	21½	Neat	6500½
					32
	dls.	*cts.*			13000
	12	00			19500
		10			16
	120	00		dols.	2080,16
		10			
	1200	00			
		2			
	2400	00	value of 200 cwt.		
	1080	00	- 90		
	12	00	- 1		
	6	00	- 2 qrs.		
	1	50	- 14 lb.		
		75	- 7		
		5 3	- ½		
Value of sugar	3500	40	3	291 2 21½	
do. coffee	2080	16	0		
	5580	56	3	4\|0)74407\|5 cents.	
Adv. 33⅓=⅓	1860	18	7	18601 35	
dols.	7440	75	0		

Ans. 18601 gilders 35 grains.

2. What sum must be paid in Boston for an invoice of goods imported from Antwerp, amounting to 7315 gilders, exchange 40 cents per gilder, at an advance of 40 per cent.?

7315	7315
40 per cent. adv.	2926 advance
2926,00	10241
	40 cents per gilder.
	4096,40

Ans. 4096 dols. 40 cts.

RUSSIA.

Accounts are kept in Petersburgh in Rubles and Copecs, reckoning 100 *copecs to* 1 *ruble.*

The course of exchange on London, in July, 1796, was 34¾*d.* sterling per ruble.
Ditto, on Amsterdam, 30 stivers banco per ruble.
Ditto, on Hamburgh, Aug. 1798, 22½ stivers banco do.
Ditto, on United States, Sept. 1802, 55 cents do.

100 lb. Petersburgh weight are equal to 88¾ lb. in the United States.

Their weights are Barquits, Poods, Pounds & Zollotnicks.

96 zollotnicks	make	1 pound.
40 pounds	"	1 pood.
10 poods	"	1 barquit.

Their long measure is the Arsheen, of 28 American inches: 9 arsheens are equal to 7 yards.

EXAMPLES.

1. What will 7500 arsheens of ravens duck come to, at 14½ rubles for 50 arsheens?

arsh. : *rub.* :: *arsh.*
50 : 14½ :: 7500 Ans. 2175 rubles.

2. What will 813 poods 5 lb. of clean hemp come to, at 30½ rubles per barquit?

lb.	*rub.*	*p. lb.*
400 :	30½ : :	813 5
		40
		32525
		30½
		975750
		16262
		4\|00)9920\|12
		2480,03

Ans. 2480 rubles 3 copecs.

3. What will 2846 poods 5 lb. of bar iron come to, at 200 copecs per pood?

	2846
	200
	569200
5 lb. ¼	25
copecs	569225

Ans. 5692 rubles 25 copecs.

4. What is the commission on 5256 rubles 33 copecs, at 3 per cent.?

	5256,33
	3
	157,68,99

Ans. 157 rubles 68 copecs.

					rub.	*cop.*
5.	4997½ arsheens	items	24 rubles per 50 arsheens		2398	80
6.	1700	do. drillings	34 copecs per arsheen		578	
7.	355	do. ticking	100	do. do.	355	
8.	118¾	do. do.	110	do. do.	130	62
9.	200 pieces of sail cloth		21 rubles per piece		4200	
10.	2101 poods 25 lb. hemp		31	do. per barquit	6515	04

11. How many rubles must be received in Petersburgh, for a bill of 15500 gilders on Amsterdam, when the exchange is 30 stivers per ruble?

st.	*cop.*	*gild.*		*gild.*
As 30 :	100 : :	15500	Or thus, ½	)15500
		20		5166,66⅔
		310000 stivers.		10333,33⅓
		100		
		3\|9)3100000\|0		
		10333,33⅓		

Ans. 10333 rub. 33⅓ cop.

12. A bill of £3000 sterling is drawn on London, exchange at $31\frac{3}{4}d.$ sterling per ruble: what is its value in Petersburgh?

d.	*rub.*	£.
As $31\frac{3}{4}$	: 1 : :	3000
4		20
127		60000
		12
		720000
		4

127)2880000(22677 rubles.
254
340
254
860
762
980
889
910
889
127)2100(16 copecs.
127
830
762
68 Ans. 22677 rub. 16 cop.

Two cyphers are annexed to the remainder instead of multiplying by 100 copecs.

FRANCE.

12 deniers = 1 sol, 20 sols = 1 livre.

The crown of exchange is 3 livres tournois.

A livre tournois of France is estimated at $18\frac{1}{2}$ cents in the United States.

NOTE. The word *tournois* is applied to the money of France, as sterling is to the money of England.

1. Change £.1220 sterling to French money, exchange at $17\frac{1}{8}$*d.* per crown of 3 livres tournois?

d. *liv.* £.

$17\frac{1}{8}$: 3 :: 1220

8 20

141 24400

12

292800

8

2342400

3

141)7027200(49838 livres.

564

1387

1269

1182

1128

540

423

1170

1128

42

40

141)840(5*s.*

705

135

12

141)1620(11*d.*

141

210

141

69

Ans. 49838 liv. 5 sol. 11 del

2. Change £.400 sterling to French money, exchange at $17\frac{3}{4}d.$ sterling per crown of 3 livres.

Ans. 16225 liv. 7*s.* $0\frac{8}{17}d.$

3. Change 4224 livres tournois to sterling, exchange at $17\frac{1}{2}d.$ per crown of 3 livres.

liv. *d.* *liv.*

3 : $17\frac{1}{2}$: : 4224.

$17\frac{1}{2}$

29568
4224
2112

3)73920

12)24640

2|0)205|3 4

102 13 4 Ans. £.102 13*s.* 4*d.*

Or, take $\frac{1}{3}$ of the given sum to reduce it to crowns, and multiply by the rate of exchange; the product will be the answer in pence.

$\frac{1}{3}$)4224 livres.

1408 crowns.
$17\frac{1}{2}$

9856
1408
704

12)24640 pence.

2|0)205|3 4

£.102 13 4 as above.

4. Change 49838 livres 5*s.* $11\frac{3}{17}d.$ to sterling, exchange at $17\frac{3}{4}d.$ sterling per crown. Ans. £.1220.

5. What will 2434 velts of brandy come to, at 320 livres per 29 velts? Ans. 26857 liv. 18*s.* 7*d.*

6. What is the freight of 3302½ velts, at 9 livres per ton, of 120 velts? Ans. 247 liv. 13*s.* 9*d.*

7. What is the commission on 36591 liv. 2 sols 4 den. at 2½ per cent.? Ans. 914 liv. 15*s.* 6 den.

8. What is the interest of 66476 liv. 10*s.* 9 den. for one month and 10 days, at ½ per cent. per month?

½)66476 10 9

332|38 5 4
20

7|65
12

7|84
332 7 7

10 days ⅓ 110 15 10

Ans. liv. 443 3 5

9. What is the interest of 3255 livres, for 28 days, at ½ per cent per month?

½)3255

16|27 10
20

5|50
12

6|00
16 5 6 for 1 month.

15 days ½ 8 2 9
10 " ⅓ 5 8 6
3 " ⅕ 1 12 6

Ans. liv. 15 3 9

The present money of account in France is in francs and centimes or hundredths.

In Nov. 1800, an English guinea was worth 25 fr. 75 cent.
A Spanish dollar 5 do. 53 do.

To change francs to livres tournois.

RULE. Multiply the francs by 81, and divide by 80 for livres.

EXAMPLE.

Change 3756 francs to livres.

3756
81
3756
30048
8,0)30423,6
3802 76
20
8,0)152,0
19 Ans. 3802 liv. 19 sols.

To change livres tournois to francs.

RULE. Multiply the livres by 80, and divide the product by 81 for francs.

EXAMPLE.

Change 5469 livres to francs.

5469
80
81)437520(5401,48
405
325
324
120
81
390
324
660
648
12 Ans. 5401 fr. 48 cen.

To change sols and deniers to centimes.

RULE. Take one half of the sols and deniers, as if they were integers; this half is the number of centimes required.

EXAMPLES.

	sol.	*den.*	*sol.*	*den.*	*sol.*	*den.*	*sol.*	*den.*	
Change	4	6	12	2	6	8	16	6	to centimes.
Ans.	23		61		34		83		centimes.

When there is a remainder in dividing the sols, it is to be carried to the deniers, and reckoned 10 and not 12; add this 10 to the deniers, and take one half of the sum for the remaining centime.

EXAMPLES.

	sol.	*den.*	*sol.*	*den.*	*sol.*	*den.*	
Reduce	5	8	15	4	19	6	to centimes.
Ans.	29		77		98		centimes.

If the number of deniers be 10 or 11, they are to be rejected, and in place of them you are to add 1 to the number of sols preceding, and then annex a cypher to it; one half of this is the centimes required.

EXAMPLES.

	sol.	*den.*	*sol.*	*den.*		*sol.*	*den.*	
Change	1	10	7	11	and	15	10	to centimes.
	2)20		2)80			2)160		
Ans.	10		40			80		centimes.

Sols and deniers are reduced to centimes by the preceding rule, and though the result is not accurate, yet from its simplicity and conciseness it is generally used.

TABLES

For changing Livres, Sols and Deniers to Francs and Centimes.

[N. B. The first is sufficiently exact for business; in the second the answer is calculated to the ten-thousandth part of a centime.]

	Table I.			Table II.		
	Deniers.	Fr.	Cent.	Fr.	Cent.	10,000ths of a Cent.
	1	0	0	0	0	4115
	2	0	1	0	0	8230
	3	0	1	0	1	2346
	4	0	2	0	1	6461
	5	0	2	0	2	0576
	6	0	2	0	2	4691
	7	0	3	0	2	8807
	8	0	3	0	3	2922
	9	0	4	0	3	7037
	10	0	4	0	4	1152
	11	0	5	0	4	5267
Sols.	1	0	5	0	4	9383
	2	0	10	0	9	8765
	3	0	15	0	14	8148
	4	0	20	0	19	7531
	5	0	25	0	24	6914
	6	0	30	0	29	6296
	7	0	35	0	34	5679
	8	0	40	0	39	5062
	9	0	44	0	44	4444
	10	0	49	0	49	3827
	11	0	54	0	54	3210
	12	0	59	0	59	2593
	13	0	64	0	64	1975
	14	0	69	0	69	1358
	15	0	74	0	74	0741
	16	0	79	0	79	0123
	17	0	84	0	83	9506
	18	0	89	0	88	8889
	19	0	94	0	93	8272
Livres.	1	0	99	0	98	7654
	2	1	98	1	97	5309
	3	2	96	2	96	2963
	4	3	95	3	95	0617
	5	4	94	4	93	8272
	6	5	93	5	92	5926
	7	6	91	6	91	3580
	8	7	90	7	90	1235
	9	8	89	8	88	8889
	10	9	88	9	87	6543
	12	11	85	11	85	1852
	15	14	81	14	81	4815
	20	19	75	19	75	3086

Livres.	Fr.	Cent.	Fr.	Cent.	10,000ths of a Cent.
24 -	23	70 - -	23	70	3704
30 -	29	63 - -	29	62	9630
40 -	39	51 - -	39	50	6173
50 -	49	38 - -	49	38	2716
60 -	59	26 - -	59	25	9259
70 -	69	14 - -	69	13	5803
72 -	71	11 - -	71	11	1111
80 -	79	01 - -	79	01	2346
90 -	88	89 - -	88	88	8889
96 -	94	81 - -	94	81	4815
100 -	98	77 - -	98	76	5432
200 -	197	53 - -	197	53	0864
300 -	296	30 - -	296	29	6297
400 -	395	06 - -	395	06	1729
500 -	493	83 - -	493	82	7161
1000 -	987	65 - -	987	65	4322
5000 -	4938	27 - -	4938	27	1608
10000 -	9876	54 - -	9876	54	3217

A TABLE

For reducing Francs and Centimes to Livres, Sols and Deniers.

1	-	0	2	43	2	-	2	0	6
2	-	0	4	86	3	-	3	0	9
3	-	0	7	29	4	-	4	1	0
4	-	0	9	72	5	-	5	1	3
5	-	1	0	15	6	-	6	1	6
10	-	2	0	30	7	-	7	1	9
15	-	3	0	45	8	-	8	2	0
20	-	4	0	60	9	-	9	2	3
25	-	5	0	75	10	-	10	2	6
30	-	6	0	90	15	-	15	3	9
35	-	7	1	05	20	-	20	5	0
40	-	8	1	20	30	-	30	7	6
45	-	9	1	35	40	-	40	10	0
50	-	10	1	50	50	-	50	12	6
55	-	11	1	65	60	-	60	15	0
60	-	12	1	80	70	-	70	17	6
65	-	13	1	95	80	-	81	0	0
70	-	14	2	10	90	-	91	2	6
75	-	15	2	25	100	-	101	5	0
80	-	16	2	40	200	-	202	10	0
85	-	17	2	55	300	-	303	15	0
90	-	18	2	70	400	-	405	0	0
95	-	19	2	85	500	-	506	5	0
					1000	-	1012	10	0
Francs.		Liv.	Sol.	Den.	5000	-	5062	10	0
1	-	1	0	3	10000	-	10125	0	0

SPAIN.

Spanish reckonings are of two sorts:

Money of plate, distinguished by *hard* or *plate* dollars, &c.
Money of vellon, distinguished by *current* dollars.
The former is $88\frac{4}{17}$ per cent. above the latter.

100	reals plate being equal to	$188\frac{4}{17}$	reals vellon.
100	reals vellon - - -	$53\frac{1}{8}$	reals plate.
17	reals plate - - - -	32	reals vellon.
17	piastres or current dollars	256	reals vellon.
4	maravadies - - - make - - -	1	quarto.
$8\frac{1}{2}$	quartos or 34 maravadies - - -	1	real.

The peso, piastre, or current dollar of 8 reals plate, passes at 15 reals vellon in trade, but in exchange it is estimated at 15 reals vellon 2 maravadies.

The ducat of exchange is 375 maravadies.

The real plate is estimated at 10 cents, and the real vellon at 5 cents, in the United States.

The Spanish arobe is 25 lb.

100 lb. of Spain is 97 lb. English.

To change reals vellon to reals plate.

RULE. Multiply the given sum by 17, and divide by 32 for reals plate.

EXAMPLE.

Change 800 reals vellon to reals plate.

800
17

32)13600(425
128

80
64

160
160

Ans. 425 reals plate.

To change reals plate to reals vellon.

RULE. Multiply the given sum by 32, and divide by 17 for reals vellon.

EXAMPLE.

In 425 reals plate, how many reals vellon?

425
32

850
1275

17)13600(800
136

00 Ans. 800 reals vellon.

To change reals plate and reals vellon to Federal money.

RULE. Multiply the reals plate by 10, and the reals vellon by 5, for the cents in the given sum.

EXAMPLES.

1. Change 14958 reals plate to Federal money.

14958
10

1495,80 Ans. 1495 dols. 80 cts.

2. Change 17593 reals vellon, to Federal money.

17593
5

879,65 Ans. 879 dols. 65 cts.

CADIZ.

Accounts are kept by some in hard or plate dollars, reals vellon, and quartos.

8½ quartos - make - 1 real vellon.
20 reals vellon - - - - 1 dollar of plate.

Others keep their accounts in reals plate and maravadies, reckoning 34 maravadies to 1 real plate.

To bring reals plate to dollars.

RULE. Multiply the given sum by 32, and divide by 17 for reals vellon, and divide the reals vellon by 20 for dollars.

EXAMPLE.

In 320 reals plate, how many hard dollars?

320
32
640
960
17)10240(602 reals vellon.
102
40
34
6
$8\frac{1}{2}$
17)51(3 quartos.

2|0)60|2 reals vellon.
dols. 30 2 3

Ans. 30 dols. 2 r. v. 3 q.

To change hard dollars to reals plate.

RULE. Multiply the dollars by 20 for reals vellon, and the reals vellon being multiplied by 17 and divided by 32 give the reals plate required.—Or, multiply the dollars by $10\frac{5}{8}$ for reals plate.

EXAMPLE.

In 16 hard dollars how many reals plate?

16
20
320
17
2240
320
32)5440(170
32
224
224

Ans. 170 reals plate.

Or thus,

16
$10\frac{5}{8}$
160
10
170 *R. P.*

16
5
8)80
10

PRACTICAL QUESTIONS.

The answers to which are in dollars, reals vellon, and quartos.

1. What will 45940 pipe staves come to, at 80 piastres or current dollars per M. or 1200?

45940
80

12|00)36752|00

$3062\frac{2}{3}$ current dollars.
8 reals.

$24501\frac{1}{3}$ reals plate.
32

49002
73503
$10\frac{2}{3}$

17)$784042\frac{2}{3}$(46120
68

104
102

20
17

34
34

$2\frac{2}{3}$
$8\frac{1}{2}$

17)$22\frac{1}{3}$(1
17

$5\frac{5}{6}$

2,0)4612,0

dols. 2306 .0 1

Ans. 2306 hard dols. 0 r, 1 q.

			piast.	*d.*	*r.*	*q.*
2.	21800 barrel staves at		$30\frac{1}{2}$ per 1200	417	3	7
3.	1200 hhd.	do.	40 do.	30	2	3
4.	2 casks sherry wine		30 per cask	45	3	4

The result of the following, is in reals plate, and maravadies.

5. In 610 hard dollars, how many reals plate?

610
20 reals vellon=1 hard dollar.

12200
17

85400
12200

32)207400(6481
192

154
128

260
256

40
32

8 Ans. 6481 r. p. 8 mar.

6. What will 2632 barrels of flour come to, at 11 current dollars per barrel?

2632
11

28952 piastres or current dollars.
8 reals plate=1 piastre or current dollar.

Ans. 231616 reals plate.

7. 88 lasts of white dry salt, at 6 piastres per last?

88
6

528
8

4224 Ans. 4224 reals plate.

8. Change £.600 sterling to reals plate, exchange at 36¼ *d.* sterling per piastre.

```
                600
                 20
                ----
               12000
                  12
                ----
 36¼  144000
  4       4
-----  ------
145 ) 576000 ( 3972 current dollars.
      435          8
      ----       ----
      1410      31776
      1305          3 10
      ----      -------
      1050      31779 10
      1015
      ----
       350
       290
       ---
        60
         8
        ---
145)480(3 reals.
      435
      ---
       45
       34
       --
      180
      135
      ---
145)1530(10 maravadies.
      145
      ---
       80          Ans. 31779 r. p. 10 mar.
```

9. In £.3200 sterling how many reals plate, exchange at 36¼ *d.* sterling per piastre? Ans. 169489 r. p. 22 mar.

N. B. In St. Lucar, accounts are kept in reals plate and quartos; 16 quartos to 1 real plate.

BILBOA.

Accounts are kept in Reals Vellon and Maravadies, 34 maravadies making 1 real.

The pound in Bilboa consists of 17 oz. except in iron, which is but 16 oz.

32 velts are equal to	66 gallons	in the U. States.
100 fanagues	152 bushels	do.
100 varas - -	108 yards	do.

To change piastres or current dollars to reals plate.

RULE. As 1 current dollar is to 15 reals 2 maravadies, so is the given sum to the reals required: or multiply the sum by 15 reals 2 maravadies, for reals.

EXAMPLE.

In 5000 current dollars, how many reals vellon?

$2 = \frac{1}{17}$)5000 Or thus, 5000

15 2=1 cur. dol. 2

25000 34)10000

5000

294 4 294 4

75294 4 Ans. 75294 r. vel. 4 mar.

To change current dollars to sterling.

RULE. As 1 dollar is to the rate of exchange, so is the given sum to the sterling required.

EXAMPLE.

In 5000 piastres or current dollars, how many pounds sterling, exchange at $36\frac{3}{8}$ per dollar?

p.	d.	p.
As 1	: $36\frac{3}{8}$	: : 5000

$36\frac{3}{8}$

180000

1875

12)181875

2|0)1515|6 3

Ans. £.757 16 3

5000

3

8)15000

1875

To change sterling to current dollars.

RULE. As the rate of exchange is to 1 dollar, so is the given sum to the dollars required.

EXAMPLE.

In £.757 16s. 3d. sterling, how many current dollars, exchange at $36\frac{3}{8}$d. sterling per dollar?

	d.		dol.		£.	s.	d.	
As	$36\frac{3}{8}$	:	1	: :	757	16	3	Ans. 5000 cur. dls. or piast.

To change sterling to reals vellon.

RULE. As the rate of exchange is to 15 reals 2 maravadies, so is the given sum to the reals required.

EXAMPLE.

In £.436 10s. sterling, how many reals vellon, exchange at $36\frac{3}{8}$d. sterling per current dollar?

	d.		r. m.		£.	s.
As	$36\frac{3}{8}$	:	15 2	: :	436	10

8 — 20

291 — 8730

12

104760

8

838080

15 2

4190400

838080

49298

291)12620498(43369

1164

980

873

1074

873

2019

1746

2738

2619

119

34 mar.=1 real.

291)4046(13

2 mar.=$\frac{1}{17}$

Or, 838080 / 2 / 34)1676160 mar. / 49298 reals.

Ans. 43369 reals, 13 mar.

PRACTICAL QUESTIONS.

1. What will 122 quintals of fish come to, at 136 reals per quintal?

122
136
732
366
122
16592

Ans. 16592 reals.

2. What is the cranage of 1137 quintals of fish, at 10 maravadies per quintal? Ans. 334 r. 14 m.

BARCELONA.

The moneys of account in Barcelona and throughout the Province of Catalonia are Livres, Sols and Deniers.

12 deniers	make	1 sol.
20 sols		1 livre.
37½ sols, or 1½ livre		1 hard dollar.
28 sols.		1 cur. dol. the piast. of exchange.

To change livres to hard dollars.

RULE. Divide the livres by 3 and then by 5, and add the two quotients together for hard dollars.

EXAMPLES.

1. How many hard dollars in 360 livres?

3 | 360
5 | 120
| 72
192 Ans. 192 hard dolls.

2. How many hard dollars must be paid for an invoice of goods amounting to 7134 livres?

3 | 7134
5 | 2378
| 1426⅔
3804⅔ Ans. 3804 h. d. 30 sols.

To change hard dollars to livres.

RULE. Add to the given sum, the half, quarter and eighth of it, and the sum will be the livres required.

EXAMPLES.

1. In 192 hard dollars, how many livres?

$\frac{1}{2}$	192
$\frac{1}{4}$	96
$\frac{1}{8}$	48
	24
	360

Ans. 360 livres.

2. How many livres in 3804$\frac{4}{5}$ hard dollars?

$\frac{1}{2}$	3804,8
$\frac{1}{4}$	1902,4
$\frac{1}{8}$	951,2
	475,6
	7134,0

Ans. 7134 livres.

To change livres to current dollars.

RULE. Multiply the livres by 5, and divide that product by 7, for current dollars.

EXAMPLE.

Change 2716 livres to current dollars.

2716
5

7)13580

1940 Ans. 1940 cur. dols.

To change current dollars to livres.

RULE. Multiply the current dollars by 7, and divide the product by 5, for livres.

EXAMPLE.

Change 1940 current dollars to livres.

1940
7

5)13580

2716 Ans. 2716 livres.

PORTUGAL.

Accounts are kept in Millreas and Reas, reckoning 1000 *reas to* 1 *millrea of* 5*s.* 7½*d. sterling, or* 1 *dol.* 25 *cts. in the U. States.*

A vinten is 20 reas, and 5 vintens is a festoon of 100 reas.

EXAMPLES.

1. Change 579 millreas 740 reas to Federal, at 1 dol. 25 cts. per millrea.

			M.	R
	579,740	Or thus,	579,740	
	1,25	¼ added	144,935	
	2898,700	dols.	724,675	
	69568,80			
cents	72467,500			

Ans. 724 dols. 67½ cts.

2. Change 724 dols. 67½ cts. to millreas, at 1 dol. 25 cts. per millrea.

1,25)724,675(579 mill. 740 reas.

Or deducting ¼ from the sum in Federal money gives the millreas, &c.

EXAMPLE.

¼)724,675
144,935

579,740 as before.

3. Change 579 millreas, 750 reas, to sterling, at 5*s.* 7½*d.* per millrea.

579,750
67½

4058,250
34785,00
289,875

12)39133,125

2|0)326|1 1

Ans. £.163 1 1½

4. In £.163 1 1½ sterling, how many millreas, at 5*s.* 7½*d.* per millrea?

s.	*d.*		*reas.*		£.	*s.*	*d.*
5	7½	:	1000	: :	163	1	1½

Ans. 579 millreas, 750 reas.

5. What is the commission on 6245 mill. 46 reas, at $2\frac{1}{2}$ per cent.?

6245,046
$2\frac{1}{2}$ per 1,00

12490092
3122523

156,12615 Ans. 156 mill. 126 reas.

6. Suppose a cargo is sold for 6245 millreas, at 2 months credit, for prompt payment of which $\frac{1}{2}$ per cent. per month is allowed: how much is the discount?

$\frac{1}{2}$)6245
31,225 for 1 month,
2
Ans. 62,450 for 2 months.

Or thus,
$\frac{1}{2}$ per cent. for 2 months=1 per cent.
6245
1
62,45

7. Suppose you import 5960 hhd. staves and 5060 barrel staves, on which there is a duty of 23 per cent. which is taken in kind, how many of each remain for sale?

Ans. 4590 hhd. and 3897 bbl.

		M. R.	M. R.
8.	702 barrels of flour at	8 600 per bbl.	6037,200
9.	4590 hhd. staves -	030 per stave	137,700
10.	3897 barrel do. -	020 per do.	77,940
11.	71 alquiers of beans	480 per alquier	34,080

Measures of Portugal.

Cloth Measure.

A vara is $43\frac{1}{3}$ inches English.
A covedo is $26\frac{2}{3}$ ditto.

Wine Measure.

1 almude is 12 canadoes.
1 canado is 4 quarteels.
An almude is $4\frac{1}{2}$ gallons English wine measure.
A canado is 3 pints English.

Corn Measure.

1 moy is 15 fangas.
1 fanga is 4 alquiers.
1 moy of 60 alquiers is 3 English quarters, or 24 bushels Winchester measure.
1 quarter is 20 alquiers.
1 English bushel is 2½ alquiers in Lisbon, 2 alquiers in Oporto, and 2⅔ alquiers in Figuiras.
A moy of salt is the same measure as corn.
A pipe of coals is 16 fangas.
1 fanga is 8 alquiers.
A pipe of coals is 128 alquiers, which at 2½ alquiers per bushel, is 51½ bushels English.

WEIGHTS OF PORTUGAL.

1 quintal is 4 arobes.
1 arobe is 32 pounds, so that a quintal is 128 lb. Portugal wt. which is equal to about 132 lb. English, avoirdupois wt.
A pound is about 16½ ounces English.

Loss by exchanging English money in Portugal.

An English guinea passes at Lisbon for 3 m. 600 r. which is 134 reas, or 9 pence less than the value.
An English crown passes for 600 reas, which is 89 rebs, or 6 pence less than the value.
An English shilling passes for 160 reas, which is 18 reas or about 1¼ penny less than the value.

LEGHORN.

Accounts are kept in Piastres, Soldi, and Denari, reckoning 12 deniers to 1 soldi, and 20 soldi to 1 piastre or dollar of 48d. sterling at par.

1⅓ paul, or 2 sols, are equal to		1 livre.
6 livres - - -		1 piastre or dollar.
5¾ livres (effective money) -		1 do.
1 ducat - - - -		1¼ do.

Weights.—A pound is only 12 ounces in all commodities.

145 lb. is said to be equal to the English quintal of 112 lb. but fish generally renders about 136 to 138 lb. per quintal.

145 lb. in Leghorn makes 112 lb. in the United States.

4 brasses	- - -	1 cane.
100 brasses	- - - -	64 yards U. States.
1 palm	- - - -	9¼ inches. do.

4 sacks are 2 per cent. less than an English quarter, of 8 bushels.

EXAMPLES.

1. How much will 5630 lb. of ginger come to, at 9 piastres per 100?

5630
9

506|70
20

14|00 Ans. 506 piast. 14 sol.

2. What will 9760 lb. of pepper come to, at 27¼ ducats per 100?

9760
27¼

68320
19520
2440

¼)265960
44326⅔

piast. 3102|86⅔
20

soldi 17|33⅓
12

den. 4|00

Ans. 3102 piast. 17 sol. 4 den.

3. What will 143700 lb. of pitch come to, at 26 pauls per 100?

NOTE. One paul is equal to $\frac{2}{3}$ of a livre.

143700
26
862200
287400
37362,00 pauls.
2
3)74724
6)24908 livres.
4151 6 8
Ans. 4151 piast. 6 sol. 8 den.

4. How much will 4200 sacks of wheat come to, at 26 livres, effective money, per sack?

4200
26
25200
8400
109200 livres.

liv. piast.
$5\frac{3}{4}$: 1 : : 109200 livres.

Ans. 18991 piast. 6 sol. 1 den.

				piast.	s.	d.
5.	100 barrels pork	16 piastres	per barrel	1600		
6.	1000 do. flour	$10\frac{1}{2}$ do.	do.	10500		
7.	2660 lb. coffee	26 do.	per 100	691	12	0
8.	6578 lb. pimento	18 do.	do.	1184	0	9
9.	9370 lb. rice	24 liv. cur. mon. pr.	100	374	16	0
10.	97270 lb. logwood	16 piastres	per 1000	1556	6	4
11.	4170 lb. Rus. wax	$32\frac{1}{2}$ ducats	per 100	1629	15	6
12.	104060 lb. sugar	30 piastres	per 151 lb.	20674	3	5
13.	3350 lb. loaf sugar	30 do.	per 100	1005	0	0
14.	1000 casks tar	$4\frac{1}{2}$ do.	per cask	4500	0	0
15.	100000 staves	8 do.	per 100	4000	0	0

NAPLES.

Accounts are kept in Ducats and Grains, reckoning 100 *grains to* 1 *ducat.*

The current coins are grains, carlins, ducats, dollars, and ounces.

10 grains make 1 carlin; 10 carlins 1 ducat; 3 ducats 1 ounce.

The Naples dollar passes for 120 grains, and the Spanish dollar for 126 grains.

100 lb. Naples weight are equal to 64⅝ lb. English.

Brandy is sold per cask of 12 barrels, or 132 gallons: 60 karafts make a barrel.

Sewing Silks are sold per lb. of 12 ounces.

Lustrings are sold per cane of 84 inches.

Sugar, coffee, fish and tobacco are sold per canter, of 196 lb. in the United States.

The cantar is subdivided into 100 rotolas of 33 ounces each.

EXAMPLES.

1. What is the amount of 10 casks 6 barrels 29 karafts of brandy, at 92 ducats per cask?

			92	
			10	
			920	
6	bbl.	½	46	
20	kar.	1/12	2 55	
5	do.	¼	64	nearest.
4	do.	⅕	51	
			969 70	Ans. 969 ducats, 70 grains

2. What is the amount of 2 casks of clayed sugar, weighing neat 10 cantars 51 rotolas, at 65 dollars per cantar?

rot. *dols.* *rot.*

100 : 65 :: 1051

65

5255

6306

duc. 683,15

Or thus,

65

10

650

50 rot. ½ 32.50

1 do. 1/50 65

duc. 683 15

Ans. 683 ducats, 15 grains.

3. How much is the amount of 1 box of scented soap, containing 100 parcels of 16 ounces each, at 22 grains per rotola?

100
16

oz.		*gr.*			
33	:	22	: :	1600 oz.	Ans. 10 ducats, 66 grains.

4. What is the commission on 996 ducats, at 2 per cent.? Ans. 19 ducats, 92 grains.

	can. rot.		*ducats.*		*duc.*	*gr.*
5.	3 73	of coffee - -	73	per cantar	272	29
6.	16 19¾	soap - - -	21	" "	340	14
7.	1 59	do. - -	21	" "	33	39
8.	7 97¾	do. - - -	21	" "	167	52
9.	67½	scented do. -	30	" "	20	25
10.	52	white do. -	17	" "	8	84
11.	7 64	raisins - -	12	" "	91	68
12.	2 casks 11 bbls. 4 kar.	brandy	102	per cask	298	06
13.	10 do. 43 do.	do.	92	" "	82	16
14.	9 do. 12 do.	do.	92	" "	70	53
15.	355 canes of silk	- -	2 50	per cane	887	50

TRIESTE.

Accounts are kept in Florins and Kreutzers—60 *kreutzers make* 1 *florin.*

The exchange on London (8th July, 1803) was 12 florins for the pound sterling.

The other kinds of money are Soldi and Livres.

20 soldi - - make - - 1 livre.
5¼ livres - - " - - 1 florin.

100 lb. Vienna weight=123 lb. Avoirdupois.

A brace is 27 inches, or ¾ of a yard English.

A barrel of wine is 18 gallons.

A staro of wheat is 2⅜ bushels nearly—3⅓ staros is equal to an English quarter of 8 bushels.

Sales and purchases are usually made in bills on Vienna at 8 months date.

EXAMPLES.

1. What is the amount of 263 lb. Vienna weight, of soap, at 22 kreutzers per lb.?

263
22
526
526
6|0)578|6
96 26 Ans. 96 flor. 26 kreutzers.

2. 758 gallons wine, at 21 florins 30 kreutzers per barrel?

758
21
758
1516
30 kr. ½ 379
18)16297(905
162
97
90
7
60
18)420(23
36
60
54
6 Ans. 905 flor. 23½ kr.

		fl.	kr.		fl.	kr.
3.	120 staros of wheat at	4	20	per staro	Ans. 520	00
4.	715 braces of silk	3	50	per brace	2740	50
5.	1730 lb. coffee		58	per lb.	1672	20

GENOA.

Accounts are kept in Denarii, Soldi and Pezzos, or Lires.

12 denarii - make - 1 soldi.
20 soldi - - - - - 1 pezzo or lire.
1 pezzo of exchange - - $5\frac{3}{4}$ lires.

The course of exchange is various—from 47*d.* to 58*d.* sterling per pezzo or lire.

In Milan, 1 crown = 60 soldi of Genoa.
Naples, 1 ducat = 86 do.
Leghorn, 1 piastre = 20 do.
Sicily, 1 crown = $127\frac{1}{2}$ do.

To reduce exchange money to lire money.

RULE. Multiply the exchange money by $5\frac{3}{4}$ for lire money.

EXAMPLE.

In 384 pezzos of exchange how many lires?

384
$5\frac{3}{4}$

1920
$\frac{1}{2}$ 192
$\frac{1}{4}$ 96

2208 Ans. 2208 lires.

To reduce lire money to exchange.

RULE. Multiply the lire money by 4 and divide the product by 23 for exchange.

EXAMPLE.

In 2208 lires how many pezzos of exchange?

2208
4

23)8832(384
69

193
184

92
92

— Ans. 384 pezzos of exchange.

To reduce Lires to Sterling.

RULE. As 1 lire is to the rate of exchange, so is the lires to the sterling required.

EXAMPLE.

In 360 lires how much sterling, exchange at 54*d.* sterling per lire?

l.		*d.*		*l.*
1	:	54	: :	360
				54
				1440
				1800
				12)19440
				2\|0)162\|0
				£.81

Ans. £.81 0 0 sterling.

VENICE.

Venice has three kinds of money, viz. Banco money, Banco current money, and Picoli money. Banco money is 20 per cent. better than banco current, and banco current 20 per cent. better than picoli.

The different denominations of money are Denarii, Soldi, Grosi, and Ducats.

12 denarii, or deniers d'or, make 1 soldi, or sol d'or.
$5\frac{1}{6}$ soldi - - - - - 1 gros, or grosi.
24 gros, or grosi - - - - 1 ducat.

100 ducats banco of Venice in Leghorn = 93 pezzos.
do. Rome = $68\frac{1}{2}$ crowns.
do. Lucca = 77 do.
do. Frankfort = $139\frac{1}{2}$ florins.

The par of exchange in 1798 was $54\frac{1}{4}$*d.* sterling per ducatt banco.

EXAMPLE.

How much sterling is equal to 2712 ducats banco, exchange at $50\frac{1}{4}$ *d.* sterling per ducat banco?

duc.		*d.*		*duc.*
1	:	$50\frac{1}{4}$	: :	2712
		4		201
		201		2712
				54240
				4)545112 farth.
				12)136278 pence.
				2\|0)1135\|6 6 shillings.
				Ans. £.567 16 6 sterling.

SMYRNA.

Accounts are kept in Piastres and hundredths, except the English accounts, which from ancient custom are kept in piastres and eightieths or half paras.

The fractional parts are sometimes called aspers, 100 aspers to 1 piastre.

The following calculations are made in piastres and hundredths.

A piastre is equal to 40 paras, and a Spanish dollar to 136 paras.

340 piastres are equal to 100 Spanish dollars.

The exchange on London was 13 piastres for 1 pound sterling, May 14th, 1800.

Their weights are the Rotola, Oke, Cheque and Tiffee.

A rotola - -	marked *Ro.*	is 180 drams.
An oke - - - - -	%	400 do.
A cheque of opium - - -		250 do.
do. of goats wool - -		800 do. or 2 okes.
A tiffee of silk - - -		610 do.

100 rotolas, or 1800 drams, or 45 okes, are a quintal of this country.

112 lb. English should render here $40\frac{3}{4}$ okes, or $90\frac{5}{9}$ rotolas. 45 okes of this country render $123\frac{3}{4}$ lb. English.

A pike is 27 inches nearly.

To change piastres to dollars.

RULE. Multiply the piastres by 5, and divide the product by 17, for cents.

EXAMPLE.

Change $1277\frac{55}{100}$ piastres to dollars.

1277,55
5

17)6387,75(375,75
51
128
119
97
85
127
119
85
85 Ans. 375 dols. 75 cts.

To change dollars to piastres.

RULE. Multiply the dollars by $3\frac{4}{5}$ for piastres.

EXAMPLE.

Change 375 dollars 75 cents to piastres.

375,75
$3\frac{4}{5}$

1127,25
75,15 } for $\frac{4}{5}$
75,15 }

Ans. 1277,55 piastres.

PRACTICAL QUESTIONS.

1. How much will 10 serons of cochineal come to, weighing neat 724 okes 73 rotolas, at 80 piastres per oke?

724,73
80

Ans. 57978,40 piastres.

2. 299 bags of sugar, weighing 506 quintals 96 roto tare 14 rotolas per bag, at 110 piastres per quintal?

gross	506	96		299
tare	41	86		14
neat	465	10		1196
		110		299
Ans.	51161	60 piast.		100)4186
				41 86

3. 4 cases of opium, weighing gross 1026 rotolas, tare okes 75 rotolas, at $10\frac{3}{4}$ piastres per cheque?

NOTE. 1 rotola is equal to $\frac{9}{20}$ of an oke, and 1 oke to $1\frac{3}{5}$ cheq

	rot.	1026	
		9	
	20)9234 rot.		
gross okes	461	70	
tare	84	75	
neat okes	376	95	376 95
		$1\frac{3}{5}$	3
	376	95	5)1130 85
	226	17	226 17
cheques	603	12	
		$10\frac{3}{4}$	
	6031	20	
	301	56	
	150	78	
Ans. piast.	6483	54	

4. 893 pieces of copper, neat okes 19743,85, at $\frac{7}{10}$ or paras per oke?

	o.	r.
	19743,85	
		70
4\|0)13820695\|0		
Ans. piast.	34551	73

5. What is the custom-house duty on 19740 okes of copper at $2\frac{1}{2}$, agio $2\frac{1}{2}$ per cent. ?

NOTE. The charges are all established by a tariff of the Levant Company.

19740
$2\frac{1}{2}$
39480
9870
4|0)4935|0
agio $2\frac{1}{2}=\frac{1}{40}$)1233,75 amount of duty at $2\frac{1}{2}$ paras.
30,84 agio at $2\frac{1}{2}$ per cent.

Ans. piast. 1264,59

6. English consulage on 430 quintals, at $5\frac{1}{2}$ piast. agio 7 per cent.

430
$5\frac{1}{2}$
2150
215
2365
7

Ans. piast. 165,55

7. Custom-house duties on 88 quintals 90 rotolas, at $\frac{90}{100}$ agio $2\frac{1}{2}$ per cent.

88,90
20
11|0)17780|0
$2\frac{1}{2}=\frac{1}{40}$)16,16
,40

Ans. piast. 16,56

8. What will the following charges amount to, viz. porterage $\frac{8}{7\,0}$, house porters $\frac{4}{4\,0}$, weighing $\frac{2}{4\,0}$, chan duty $\frac{2}{4\,0}$, visiting and marketing $\frac{1}{4\,0}$ per quintal on 438 quintals?

porterage	8	438
house porters	4	17
weighing	2	
chan duty	2	4\|0)744\|6
visiting	1	
	17	Ans. piast. 186,15

PALERMO IN SICILY.

Accounts are kept in Onges, Tarins and Grains.

20 Grains - make - 1 Tarin.
30 Tarins - - - - 1 Onge or Once.

Feb. 3, 1803, the value of the money of Palermo in U. S. currency was as follows:

1 Grain - - - equal to - - - 4 Mills.
20 do. = 1 Tarin - = - - - 8 Cents.
240 do. = 12 do. = 1 Sc. dol. = - 96 do.
600 do. = 30 do. = 2½ do. = 1 Onge = 240 do.

The Spanish dollar is current at 252 grains. The value of the onge, at par, is 11*s.* 3*d.* sterling. The exchange on London, Feb. 3, 1803, was 56 tarins for the £. sterling, or 10*s.* 8½*d.* sterling per onge.

The Cantar of Sicily = 176 lb. Avoirdupois.
The Rottoli - = 1¾ lb. do.
100 Rottoli make a Cantar.

A Cantar of oil is 25 gallons English measure. The Sicilian barrel contains 9 gallons.

Mahogany is sold by weight; one foot board measure will weigh about 2 rottoli.

The measure called Caffis is 3¼ gallons.
The lb. in Sicily is 12 oz. Avoirdupois.
The Salm is 485 lb. Avoirdupois.

EXAMPLES.

1. What cost 264 cantars 25 rottoli of Mahogany, at 8 onges 15 tarins per cantar?

264
8
2112
15 tar. $\frac{1}{2}$ = 132
25 rot. $\frac{1}{4}$ = 2 3 15
2246 3 15

Ans. 2246 ong. 3 tar. 15 gr.

2. A cargo consisting of 3564 quintals of fish, invoiced at 5 dols. 50 cts. per quintal, is sold in Palermo at 75 per cent. advance: what sum must be received for it at 252 grains per dollar?

3564
5
17820
50 cts. $\frac{1}{2}$ = 1782
19602
50 per ct. $\frac{1}{2}$ = 9801
25 - - $\frac{1}{2}$ = 4900 50
dols. 34303 50
252
68606
171515
68606
50 cts. $\frac{1}{2}$ = 126
2|0)864448|2 grains.
3|0)43222|4 2
14407 14 2

Ans. 14407 ong. 14 tar. 2 gr.

3. What is the brokerage on 13131 ong. 12 tar. at $1\frac{1}{8}$ per cent.?

13131 12
1

13131 12
$\frac{1}{8}$ = 1641 12 15

147|72 24 15
30

21|84
20

16|95

Ans. 147 ong. 21 tar. 16 gr.

ENGLISH WEST-INDIES.

Accounts are kept in Pounds, Shillings and Pence.

JAMAICA AND BERMUDAS.

The Spanish dollar passes at 6*s.* 8*d.*; 3 dollars are equal to 20 shillings, or 1 pound, Jamaica currency.

To change Jamaica currency to Federal.

RULE. Multiply the pounds by 3 for dollars. If there be shillings, &c. increase the pence in the given sum by $\frac{1}{4}$ for cents.

EXAMPLES.

1. When lumber is sold in Jamaica at £.15 per M. how much is it in Federal money?

15
3

Ans. 45 dollars.

2. Change £.54 12*s.* 11*d.* Jamaica currency to Federal.

54 12 11
20
1092
12
¼)13115
3278¾
163,93¾ Ans. 163 dols. 93¾ cents.

3. What will 102,896 feet of boards come to at £.15 per M?

102,896
15
514480
102896
£.1543,440
20
s. 8,800
12
d. 9,600 Ans. £.1543 8 9

4. What will 5 hhds. of sugar come to, weighing 8519 lb. neat, at 70 shillings per 100 lb.?

8519
70
2|0)596|3,30
Ans. £.298 3 3

5. How much will 5 hhds. of sugar come to, weighing 9103 lb. neat, at 75 shillings per 100 lb.?

9103
75
45515
63721
2|0)682|7,25
Ans. £.341 7 3

BARBADOES.

The Spanish dollar is 6*s.* 3*d.* Barbadoes currency.

To change Barbadoes currency to Federal.

RULE. Increase the pence in the given sum by $\frac{1}{3}$ for cents.

EXAMPLE.

Change £.49 11*s.* 10*d.* Barbadoes money to Federal.

£.49	11	10	Proof	$\frac{1}{4}$)15869$\frac{1}{3}$ cents	
20				3967$\frac{1}{3}$	
991				12)11902	pence.
12				2\|0)99\|1	10
$\frac{1}{3}$)11902				£.49	11 10
3967$\frac{1}{3}$					
158,69$\frac{1}{3}$			Ans. 158 dols. 69$\frac{1}{3}$ cents.		

Other calculations as in Jamaica.

MARTINICO, TOBAGO AND ST. CHRISTOPHER'S.

These islands being inhabited by French and English, the former keep their accounts in Livres, Sols and Deniers, and the latter in Pounds, Shillings and Pence.

A *current* dollar is 8*s.* 3*d.*
A *round* dollar passes for 9*s.*

When payment of freight or goods is mentioned in Spanish dollars, disagreement respecting their value has frequently arisen; and to prevent it some persons distinguish them by *round* and *current* dollars; others mention the *bits* to each. But the most certain way is to specify the number of shillings or livres, instead of dollars; thus A sells to B a barrel of flour, at 99 shillings, or livres; in payment, B may allow him 11 dollars at 9 shillings each, or 12 dollars at 8*s.* 3*d* each, either being equal to 99 shillings or livres, the sum specified by their agreement.

FRENCH WEST-INDIES.

Accounts are kept in Livres, Sols and Deniers.

12 deniers - make - 1 sol.
20 sols - - - - 1 livre.

The Spanish dollar passes in some places for 6 livres 5 sols, and in others for 9 livres.

1 cwt. or 112 lb. in the U. States is equal to 104 lb. French.

100 lb. French are equal to 108 lb. nearly in the U. States.

When any commodity is to be marked in French weight, 4 per cent. is added to the neat hundreds; thus a hogshead of fish weighing neat 10 cwt. is marked 1040 lb. Fish shipped from the United States will answer to the weight thus marked, provided it comes out in good order, and the *cask* weighs exactly the customary tare, which is 10 per cent.

100 lb. of coffee or cotton, bought in the French Islands, will or ought to weigh 103 lb. (it will often weigh 110 lb.) in the United States; and as these articles are sold here per lb. there is a gain of 8 to 10 per cent. in the weight. But on sugar, which is bought for 100 lb. and sold here per 112, there is a loss of 6 per cent. because there is 4 per cent. between the American cwt. and 100 lb. French, and 2 per cent. difference in the tare. The tare on brown sugar in the French islands being 10 per cent. and the American tare 12 per cwt. The loss on clayed sugar is greater, occasioned by the customary tare, which is but 7 per cent. in the French islands, whereas it is here 12 per cent. the same as on brown sugar.

NOTE. The tare allowed on sugar among merchants is 12 per 112; that allowed by the custom-house is 12 per 100.

[*See Tare and Tret, page* 84.]

EXAMPLES.

1. Change 10692 livres to dollars, at $8\frac{1}{4}$ livres per dollar.

$8\frac{1}{4}$ 10692
4 4

33) 42768(1296
33

97
66

316
297

198
198

Ans. 1296 dolls.

2. Change 7713 livres to dollars, at 9 livres per dollar.

9)7713

Ans. 857 dollars.

3. In 1296 dollars, at 8¼ livres each, how many livres?

1296
8¼

10368
324

Ans. 10692 livres.

4. 857 dollars, at 9 livres each, how many livres?

857
9

Ans. 7713 livres.

What will 1642 lb. of coffee come to, at 15 sols per lb.?

1642
15

8210
1642

2|0)2463|0 sols.

livres 1231 10 Ans. 1231 livres 10 sols.

6. 1780 lb. cotton at 157 livres 10 sols per 100 lb.?

1780
157

12460
8900
1780
10 sols ½ 890

liv. 2803|50
20

sols. 10|00 Ans. 2803 liv. 10 sols.

7. 24 barrels of beef at 101 liv. 1 sol. 3 den. per barrel?

liv.	*s.*	*d.*
101	1	3
		6
606	7	6
		4
2425	10	0

Ans. 2425 liv. 10 sols.

8. How many dollars, at 8 livres 5 sols per dollar, will pay for 12 hhds. of brown sugar, weighing 13365 lb. at 40 livres per 100 lb.?

13365
40

$8\frac{1}{4}$ | 5346,00
4 | 4

33) 21384(648 dols.
198

158
132

264
264

Ans. 648 dols.

9. A cargo, amounting to 12536 dols. in the United States, is sold at $12\frac{1}{2}$ per cent. advance on the invoice: how many livres will it amount to, estimating the dollar at $8\frac{1}{4}$ livres each?

$12\frac{1}{2} = \frac{1}{8}$)12536 invoice.
1567 advance.

14103 amount.
8

112824 livres at 8 per dollar.
5 sols $\frac{1}{4}$ $3525\frac{3}{4}$

Ans. $116349\frac{3}{4}$ livres at $8\frac{1}{4}$ per dollar.

				sols. d.	liv.	s.	d.
10.	6 hhds. coffee,	wt.	4471 lb.	at 14 6 per lb.	3241	9	6
11.	14 do. sugar,	do.	16477	- 38 liv. per 100	6261	5	2
12.	1 bale cotton	do.	227	- 150 do.	340	10	0
13.	94 hhds. fish,	do.	101313	- 33 do.	33433	5	9
14.	16 casks rice,	do.	6575	- 40 10 do.	2662	17	6
15.	1390 hoops	- - - - - - - -		480 per M.	667	4	0
16.	15059 feet of boards	- - - - -		100 do.	1505	18	0
17.	48 shaken hhds. with heads			- 7 15 per hhd.	372	0	0
18.	29 barrels of beef	- - - - -		90 15 per bbl.	2631	15	0
19.	6759 velts of molasses	- - -		26 per velt	8786	14	0
20.	32670 gals. do. at 73 l. 7s. 9d. per tierce of 60 gals.				39959	9	10

SPANISH WEST-INDIES.

Accounts are kept in Havana, Laguira, Vera Cruz, &c. in Dollars and Reals, reckoning 8 reals to a dollar.

The Spanish arobe is 25 lb.

EXAMPLES.

1. What will 123 pieces bretagnes come to, at 26 reals per piece?

123
26

738
246

8)3198

399 6 Ans. 399 dols. 6 reals.

2. 21784 feet boards, at 45 dollars per thousand?

21784
45 per M.

108920
87136

980|280
8

2|240 Ans. 980 dols. 2 reals.

3. 153 cases of gin, at $8\frac{4}{8}$ dollars per case.

153
$8\frac{4}{8}$

1224
4 reals 76 4
2 do. 38 2

1338 6 Ans. 1338 dols. 6 reals.

4. What is the commission on 14792 dollars 5 reals at 4 per cent.?

14792 5
4

591|70 4
8

5|64 Ans. 591 dols. 5 reals.

5. What will 42 bbls. of white sugar come to, weighing gross 415 arobes 18 lb. tare and tret on the whole 858 lb. at 26 reals per arobe?

	ar.	*lb.*
	415	18
858 lb. make	34	8
	381	10
	26	
	2286	
	762	
10 lb. = $\frac{1}{4}$ arobe	10	

8)9916 reals.

1239 4 Ans. 1239 dols. 4 reals.

			dls.	*rls.*
6.	125 pieces bretagnes at	26 reals	406	2
7.	500 do. do.	$24\frac{1}{2}$ do.	1531	2
8.	80 umbrellas	$6\frac{1}{2}$ dollars	520	0
9.	147 arobes of butter	25 do. per 100 lb.	918	6
10.	2405 arobes of 19 lb. sugar	25 reals pr. arobe	7518	0
11.	1660 do. 12 lb. do.	21 do. do.	4358	7
12.	16695 feet boards	40 dols. per M.	667	6

EAST-INDIES.

CALCUTTA.

Accounts are kept in Rupees, Annas and Pice.

12 pice make 1 anna, 16 annas 1 rupee.

By the *bazar*, or market exchange, for June, 1797, the exchange was, viz.

100 English guineas were equal to 956 rupees 4 annas.

100 Spanish dollars were equal to 212 rupees.

In weights—16 chittacks make 1 seer, 40 seers 1 maud.

The factory maud is 75 lb. English.

The bazar maud is 84 lb. ditto.

The imports are sold by the factory maud and current rupees.

The exports are bought by the bazar maud and sicca rupees.

100 sicca rupees are equal to 116 current rupees.

Bednah, tin-plates, and hides, are sold per corge, 20 to a corge.

The cavid is half a yard English.

EXAMPLES.

1. What will 3905 dry hides amount to, at 12 rupees per corge?

h.		*r.*			*h.*
20.	:	12	:	:	3905
					12

2|0)4686|0

2343 Ans. 2343 rupees.

2. How much will 189 bazar mauds 31 seers 8 chittacks of sugar come to, at 6 rupees per maud?

		189	31	8
		6		
		1134		
20 seers	$\frac{1}{2}$	3		
10	$\frac{1}{4}$	1	8	
1	$\frac{1}{10}$	0	2	4
8 chit.	$\frac{1}{5}$	0	1	2
		1138	11	6

Ans. 1138 r. 11 a. 6 p.

BOMBAY.

Accounts are kept in Rupees, Quarters and Rees.

100 rees make 1 quarter, 4 quarters 1 rupee
218 rupees were equal to 100 Spanish dols. in April 1800.
The current money is in Mohurs, Rupees and Pice.
50 pice make 1 rupee, 15 rupees 1 mohur.
The weights are pounds, mauds and candies; the pound the same as in English.
A Bombay maud is 28 lb.
A Surat maud is 37½ lb.
21 Surat mauds or 784 lb. make 1 Surat candy.
Cotton is sold by the Surat candy.
Camphire and Mocha coffee are sold by the Surat maud.
Malabar pepper is sold by the Bombay candy of 582 lb.

EXAMPLE.

In 274 bales of cotton weighing neat 996 cwt. 2 qrs. 23 lb. how many Surat candies?

784 lb.=7 cwt. 7)996 2 23

142 200 two hundreds.
24 excess 12 per cent.
56 two quarters.
23

303 Ans. 142 can. 303 lb.

MADRAS.

Accounts are kept in Pagodas, Fanams and Cash.

80 cash make 1 fanam, 36 fanams 1 pagoda.
The Spanish Dollars were in 1798 and '99, at 165 dollars for 100 star pagodas; making the pagoda worth 165 cents.
The revenue laws of the United States reckon them at 184 cents.
The Bengal, or Sicca (new) rupee is worth 46 to 47 cts. The revenue laws of the U. States value them at 50 cents.

The current exchange is 340 Sicca rupees, for 100 star pagodas.

A lack of rupees is 100,000.

Cowries are sea shells used as small money in India, and on the coast of Africa, to make change among the natives in the bazar, or market, and in payment to the coolies or labourers. In May, 1792, a rupee was worth 5120 cowries. The common cowries are generally at 5 to 7 rupees per bazar maud, the better sort from 10 to 14 rupees per maud, the price varying according to the kind.

The picul is 133⅓ lb. English.

100 cattas make a picul.

A maud is 25 lb. Troy: 20 mauds make 1 candy.

The excellence of their cloth is defined by the *threads* in the warp.

The duty payable at the custom-house is 2½ per cent. outwards and inwards. This is taken on imports according to the invoice, and on exports at the actual cost at the bazar or market.

BATAVIA.

Accounts are kept in Rix Dollars and Stivers.

The rix dollar is 48 stivers.
The ducatoon is 80 ditto.
The Spanish dollar is 64 ditto; sometimes it passes at 60 st.

125 lb. Dutch are equal to 133⅓ lb. English.
125 do. - make - 1 picul.
100 cattas - - - 1 ditto.

EXAMPLES.

1. In 1333 rix dols. 16 stivers, how many ducatoons?

1333 16
48

10670
5333

80)64000

Ans. 800 ducatoons.

2. What will 127477 cattas of bar iron come to, at 9 rix dollars per picul?

cat.		*rd.*		*cat.*
As 100	:	9	: :	127477
				9
				11472,93
				48
				744
				372
				44,64

Ans. 11472 r. dols. 44 st.

3. What will 3894 bottles of wine come to, at 36 stivers per bottle?

	3894		
24 stiv.	½	1947	
12	½	973	24
		2920	24

Or thus, 36 stiv.=¾ rix dol.

3894
3
4)11682
2920 24

Ans. 2920 rix dols. 24 stiv.

4. In 31478 lb. of sugar, how many piculs?

125)31478(251
250
647
625
228
125
103

Ans. 251 piculs, 103 lb.

5. In 50632 lb. how many piculs? Ans. 405 7
6. In 12648 - - - - - - 101 23

7. What will 279 piculs 25 lb. of sugar come to, at $7\frac{1}{2}$ rix dollars per picul?

279
$7\frac{1}{2}$

1953
25=$\frac{1}{4}$ 139 24
1 24

2094 00 Ans. 2094 rix dols.

CHINA.

Calculations are made in Tale, Mace, Candareens and Cash.

10 cash	-	make	-	1 candareen
10 candareens	-	"	-	1 mace.
10 mace	-	"	-	1 tale.

The tale of China is estimated at 1 dollar 48 cents in the United States.

The Spanish dollar is current at 72 candareens.

Weights are in Tales, Piculs and Cattas: 16 tales make 1 catta, 100 cattas 1 picul.

A picul is equal to $133\frac{1}{3}$ lb. English.

The cavid of China is $14\frac{9}{10}$ inches; it is divided into 10 parts.

To change English pounds to cattas.

RULE. Deduct 25 per cent. or one quarter, for cattas.

EXAMPLE.

In 62668 lb. English, how many cattas?

$\frac{1}{4}$)62668
15667

Ans. 47001 cattas.

To change cattas to pounds English.

RULE. Add one third for pounds English.

EXAMPLE.

In 47001 cattas, how many lb. English?

$\frac{1}{3}$)47001
15667

Ans. 62668 lb. English.

PRACTICAL QUESTIONS.

1. What is the amount of 308 chests of bohea tea, weighing neat 101956 lb. at 15 tales per picul?

$\frac{1}{4}$)101956 lb.
25489

cat.	*tal.*		
100	: 15	::	76467 cattas.

15

382335
76467

11470,05 Ans. 11470 tales, 5 cand.

2. What will 75 chests of souchong tea come to, weighing neat 4875 lb. at 44 tales per picul?

$\frac{1}{4}$)4875
1218$\frac{3}{4}$

3656$\frac{1}{4}$ cattas.
44

14624
14624
11

1608,75 Ans. 1608 tal. 7 ma. 5 cand.

3. How many dollars will pay for an invoice of tea, amounting to 6446 tales 1 mace 6 candareens?

72)6446 1 6(8953
576

686
648

381
360

216
216 Ans. 8596 dollars.

MANILLA.

Accounts are kept in Dollars, Reals and Quartos.

12 quartos make 1 real, 8 reals 1 dollar.
The arobe is 25 lb. $5\frac{1}{3}$ arobes make 1 picul.
Their 100 lb. is equal to 104 lb. English.

EXAMPLE.

1. What will 1897 bags of sugar amount to, weighing neat 1361 piculs 1 arobe $17\frac{1}{2}$ lb. at 6 dollars per picul?

1361 1 $17\frac{1}{2}$
6

8166

1 ar.	$\frac{2}{11}$	1	0	$8\frac{2}{4}$
$12\frac{1}{2}$ lb.	$\frac{1}{2}$		4	$4\frac{1}{4}$
5	$\frac{1}{5}$		1	9
		8167	6	10

Ans. 8167 dols. 6 r. 10 q.
pic. ar. lb. dol. re.

2. 118 bags of sugar, weighing 89 1 $22\frac{1}{2}$ at 5 7
Ans. 524 dols. 7 reals.
pic. ar. lb. dol.

3. 663 bags of sugar, weighing 469 3 18 at 6
Ans. 2819 dols.

COLUMBO, ISLE OF CEYLON.

The money is in Paper, Silver and Gold.

Paper money is in the bills of the Company, and is of uncertain value.

Silver is in the rupees of different parts of India.

The Sicca rupee is worth more than any other by 7 to 8 per cent.

Gold is the Mohur pagoda.

The exchange is various, as silver is rarely seen.

6 stivers		make		1 shilling Flemish.
8 shillings	-	-	-	1 rix dollar.
30 stivers	-	-	-	1 rupee.
$64\frac{1}{2}$ do.	-	-	-	1 Spanish dollar.

JAPAN.

Accounts are in Tales, Mace and Candareens.

10 candareens make 1 mace.
10 mace - 1 tale = ¾ of a dollar, or 75 cents.
10 mace are equal to 1 rix dollar.
6 tales make a corban, a gold coin not used in accounts.
In weights—10 tales make 1 mace, 16 maces 1 cutta.
The ichan, or hickey, is 3½ feet.
The balee is 65 quarts.

35 per cent. was the duty on privileged imports in 1799. It is on exports (which are all free of duty) that the Dutch make their profit on their return to Batavia. A privilege is granted to the captains of the Dutch ships to carry money, which often sells at an advance.

EXAMPLE.

How much is the neat proceeds of 4 silver watches, at 35 tales each, deducting the duty of 35 per cent.?

35 tales
4
140
35 per cent.
700
420
49,00

Sale 140
Duty 49

Ans. Neat proceeds 91 tales.

FORM OF AN ACCOUNT OF SALES.

	tales.	Duties. *tales.*	Neat. *tales.*
4 silver watches, 1st kind	35	49	91
6 silver watches, 2d kind	23,1	48,5,1	90,0,9

The article is given in the first column, the price in the next column, the duties in the third, and the neat proceeds in the fourth.

PARTICULARS

Of the TONNAGE *of* GOODS, *as calculated to make up the Tonnage for the Freight of Goods, brought in East-India or China ships to Europe*—viz.

PIECE GOODS.

FORT ST. GEORGE.	Pieces to the ton.
Allejars	800
Betelles	400
Callawapores	800
Chintz of all sorts	R.400
Ginghams	800
Izzarees	800
Longcloths	160
Moorees	800
Sallampores	400
Sastracundies	800
BENGAL.	
Addatics	700
Alliballies	400
Allachaws	1200
Allibannies	R.800
Arras	R.400
Atchabannies	800
Baftaes	R.400
Bandannoes, or Taffa de Foolas	R.800
Carridarries	600
Callipatties	400
Coopees	600
Calicoes	400
Chillaes	600
Chowtars	600
Chunderbannies	800
Chinnachures	R.800
Cambrics	R.400
Chucklaes	400
Cushtaes	800
Cossaes	400
Charconnaes	600
Cuttannaes	R.800
Doosooties	R.400
Dungaries	R.400
Doreas	400
Dimities	600
Diapers, broad	400
Ditto, narrow	600

BENGAL.	Pieces to the ton.
Elatches	R.800
Emmerties	600
Gurrahs	400
Ditto, long	200
Ginghams, coloured	600
Humhums	400
Habassies	600
Humhums, quilted	100
Jamdannies	800
Jamwars	600
Lacceewries	600
Lungees Herba	800
Mulmuls	400
Ditto handkerchiefs	400
Mahamodietes	400
Mamodies	R.400
Nillaes	800
Nainsooks	400
Peniasoces	800
Photaes	R.800
Percaulas	800
Putcahs	R.400
Romals	R.800
Sannoes	400
Seerbetties	400
Seerbands	600
Seersuckers	600
Seerhaudconnaes	400
Seershauds	R.400
Seerbafts	400
Shaulbafts	400
Succatoons	R.800
Sooseys	400
Sorts	400
Taffeties of all sorts	R.800
Tanjeebs	400
Tepoys	R.800
Terridams	400
Tainsooks	400

PIECE GOODS.

BOMBAY.

	Pieces to the ton.
Annabatches	R.400
Bombay stuffs	R.400
Byrampauts	400
Bejutapauts	R.400
Boralchawders or brawls	1200
Betelloes	400
Chelloes	R.400
Chintz of all sorts	R.400
Dooties	R.400
Guinea Stuffs, large	600
Ditto, small	1200
Longcloths, whole pieces	160
Ditto, half do.	320
Lemanees	R.800
Musters	400
Nunsarees	R.400
Neganepauts	400
Nicannees, large	600
Ditto, small	600
Salampores	400
Stuffs, brown	R.400
Tapseils, large	400
Ditto, small	600

CHINA.

	Pieces to the ton.
Nankeen cloth	R.400
Silks, of all sorts	R.800
China ware, 50 cubical feet to the ton, or about 4 chests of the usual dimensions.	
Other measurable goods, 50 cubical feet to the ton	

N. B. Where the letter R. is set against pieces of 400 to the ton, it shows those goods are to be reduced, or brought to a standard of 16 yards long and 1 broad.

Where against pieces 800 to the ton, to 10 yards long and 1 broad.

EXAMPLE.

1000 pieces of 12 yards long and 1 1-8 broad, at 400 to the ton, make 844 pieces, or 2 tons 44 pieces.

1000 pieces of 10½ yards long and 1 1-8 broad, at 800 to the ton, is 1181 pieces, or 1 ton 381 pieces.

WEIGHABLE GOODS.

	Cwt. to the ton.
Arrangoes	20
Aloes	16
Benjamin	20
Borax	20
Cardemons, fine goods	12
Cakelack	16
Carmenia Wool	10
Cambogium	20
Cassia Lignea	8
Cassia Buds	12
Camphire	15
Cotton Yarn, fine goods	10
Cowries gruff do.	20
Coffee fine do.	18
Cinnaber	10
Cloves	12
Dragon's Blood	20
Gum Arabic	16
Elemi	16
Ammoniacum	16
Gum Opoponax	16
Sagapenum	18
Sarcocol	18
Indigo	12
Iron Kintlage	20
Musk	20
Myrrh	16
Mother-of-Pearl Shells	20
Nux Vomita	15
Pepper	16
Quicksilver	20
Rhubarb	8
Raw Silk	10
Ditto in chests	8
Ditto in bales or bundles	10
Redwood	20
Rice	20
Shellack	16
Seedlack	18
Sticklack	16

WEIGHABLE GOODS.

	Cwt. to the ton.		Cwt. to the ton.
Salt-Petre	20	Tea, Green	8
Senna	8	Bohea	10
Sago	16	Arrack Guage gallons	251
Ditto, packed in China ware	—	Canes Tale	300
Tutenague	20	Wanghees and Bamboes	3000
Tumeric	16	Rattans equal to 16 cwt.	6000
Tincal	16		

ARBITRATION OF EXCHANGE.

When the rates of exchange between several countries in succession are given, to find the rate of exchange between the first and last place in the correspondence,

RULE. Find by proportion the value of the sum originally remitted in the different moneys of the countries through which it passes according to the rates of the different exchanges, and so proceed till the whole is finished. Or,

Multiply all the first terms of the different statings together for a divisor, and the second terms, together with the sum remitted, for a dividend, and the quotient is the amount received in the denomination of the last place in the correspondence: from this result the rate of exchange is readily found by proportion.

EXAMPLES.

1. A merchant in London has credit for 500 piastres in Leghorn, for which he can draw directly at 52*d.* sterling per piastre, but choosing to have it remitted by a circular route, they are sent, by his order, to Venice at 95 piastres for 100 ducats banco; from thence to Cadiz at 350 maravadies per ducat banco; from thence to Lisbon at 630 reas per piastre of 272 maravadies; from thence to Amsterdam at 48*d.* Flemish for 400 reas; from thence to Paris at 54*d.* Flemish per crown; and from thence to London at 30*d.* sterling per crown. What is the arbitrated price between London and Leghorn per piastre, and what is gained or lost by this circular remittance without reckoning expenses?

piast.		*d. ban.*		*piast.*		*d. ban*			
95	:	100	: :	500	:	$526\frac{5}{19}$	in Venice.		
d. b.		*mar.*		*d b.*		*mar.*			
1	:	350	: :	$526\frac{5}{19}$	:	$184210\frac{1}{19}$	in Cadiz.		
mar.		*reas.*		*mar.*		*reas.*			
272	:	630	: :	$184210\frac{1}{19}$	:	426664	in Lisbon.		
reas.		*d. fl.*		*reas.*		*d. fl.*			
400	:	48	: :	426664	:	$51199\frac{1}{4}$	in Amsterdam.		
d. fl.		*cr.*		*d. fl.*		*cr.*			
54	:	1	: :	$51199\frac{1}{4}$	:	$948\frac{5}{19}$	in Paris.		
cr.		*d. st.*		*cr.*		£	*s.*	*d.*	
1	:	30	: :	$948\frac{5}{19}$	:	118	10	$4\frac{1}{4}$	sterling.

Or thus,

piast. d. b. mar. reas. d. fl. cr.

$95 \times 1 \times 272 \times 400 \times 54 \times 1 = 55814400$

piast. d. b. mar. reas. d. fl. cr. d. st.

$500 \times 100 \times 350 \times 630 \times 48 \times 1 \times 30 = 1587600000000$

558144|00)15876000000|00(12)2844$4\frac{1}{4}$

1116288

4713120

4465152

2479680

2232576

2471040

2232576

2384640

2232576

152064

4

558144)608256($\frac{1}{4}$

558144

50112

2|0)237|0 $4\frac{1}{4}$

£.118 10 $4\frac{1}{4}$ as above.

piast. £. *s. d.* *piast. d.*

500 : 118 10 $4\frac{1}{4}$: : 1 : $56\frac{171}{200}$

	£.	*s.*	*d.*
Amount received by circular remittance	118	10	$4\frac{1}{4}$
500 piastres at 52*d.* - - -	108	6	8
Ans. { Gained by circular remittance	£.10	3	$8\frac{1}{4}$
{ Arbitrated value of a piastre by do.	$56\frac{171}{200}$ *d.st.*		

2. A merchant in Boston has £.225 sterling in London which he can draw for at 54*d.* sterling per dollar, but choosing to try a circular route, it is sent to Dublin at £.100 sterling for £.109 Irish; thence to Hamburgh at 12½ marks banco per pound Irish; thence to Amsterdam at 33 florins for 40 marks banco; thence to Copenhagen at 5 florins for 2 rix dollars of Denmark; thence to Bremen at 3 marks per rix dollar of Denmark; thence to Russia at 5 marks for 2 rubles; thence to Bordeaux at 5 francs per ruble; thence to Cadiz at 18 reals plate for 10 francs; thence to Lisbon at 1250 reals plate for 100 millreas; thence to Leghorn at 750 soldi for 88 millreas; thence to Smyrna at 2 soldi per piastre; thence to Jamaica at 24*d.* Jamaica currency per piastre; and thence to Boston at 80*d.* Jamaica currency per dollar: What is gained or lost by this circular remittance?

Ans. 117 dols. 42 cts. gained.

AMERICAN DUTIES

ARE CALCULATED AS IN THE FOLLOWING

EXAMPLES.

1. What is the duty on 2885 gallons of molasses, at 5 cts. per gallon?

2885
5

14425 cents. Ans. 144 dols. 25 cts.

2. What is the duty on the above molasses, if imported in a foreign vessel, the rate being 5½ cts. per gallon, or 10 per cent. more than in an American vessel?

2885
5½

14425
1442½

dols. 158,67½

Or, 144,25 as above.
10 per cent. 14,42½

dols. 158,67½

Ans. 158 dols. 67½ cts.

3. How much is the duty on 3720 gallons of gin, at 31 $\frac{9}{16}$ cents per gallon?

3720	3720
$31\frac{9}{16}$	9
3720	10)33480
11160	
3348	3348
dols. 1186,68	Ans. 1186 dols. 68 cents.

		dols. cts.
4.	1273 lb. chocolate at 3 cents	Ans. 38 19
5.	965 lb. do. in a foreign vessel at $3\frac{3}{16}$ do.	31 $84\frac{1}{4}$
6.	1149 lb. cheese at 7 do.	80 43
7.	1295 lb. do. in a foreign vessel at $7\frac{7}{16}$ do.	99 $71\frac{1}{2}$
8.	1879 gals. Champaigne wine at 45 do.	845 55
9.	2675 do. London particular Madeira at 58 do.	1551 50

10. What is the duty on 53 cwt. 2 qrs. 21 lb. of untarred cordage, at 225 cts. per cwt.?

		225
		53
		675
		1125
2 qrs.	$\frac{1}{2}$	$112\frac{1}{2}$
14 lb.	$\frac{1}{4}$	28
7 do.	$\frac{1}{2}$	14
		$120,79\frac{1}{2}$

Ans. 120 dols. $79\frac{1}{2}$ cts.

11. What is the duty on the above cordage in a foreign vessel, at $247\frac{1}{2}$ cts. per cwt.? Ans. 132 dols. $87\frac{1}{4}$ cts.

12. How much is the duty on 4 hhds. of brown sugar, wt. gross 38 cwt. 3 qrs. 19 lb. tare 12 lb. per 100, at 2½ cents per lb.?

	3800	
	456=excess 12 per cent.	
	84	
	19	
gross	4359	4359
tare	523	12
	3836	523,08
	2½	
	7672	
	1918	
	95,90	Ans. 95 dols. 90 cts.

13. What is the duty on this sugar, in a foreign vessel, at 2½ cts. per lb.? Ans. 105 dols. 49 cts.

The modes of estimating ad valorem rates of duty.

The ad valorem rates of duty, upon goods, wares and merchandises, at the place of importation, shall be estimated by adding 20 per cent. to the actual cost thereof, if imported from the Cape of Good Hope, or from any other place beyond the same, and 10 per cent. on the actual cost thereof, if imported from any other place or country, including all charges; commissions, outside packages and insurance excepted.—(*See Laws of the United States.*)

EXAMPLES.

1. What is the duty on an invoice of silver and plated ware, imported from London, the cost, exclusive of commissions, &c. being £.359 18 4, at 15 per cent: ad valorem?

		359
		444 cents per £.sterling.
		1436
		1436
		1436
10s.	½	222
5s.	¼	111
3s. 4d.	⅓	74
actual cost		159803 cents.
10 per cent. added		15980
		175783
$10\frac{1}{15}$		17578
$5\frac{1}{2}$		8789
for 15 per cent.		26367 cts. Ans. 263 dols. 67 cts.

2. What will it amount to in a foreign vessel, at 16½ per cent. ad valorem? Ans. 290 dols. 4 cts.

The rates at which all foreign coins and currencies are estimated at the Custom-Houses of the United States.

	dols.	cts.
Each pound sterling of Great Britain, at	4	44
Each pound sterling of Ireland	4	10
Each livre tournois of France		18½
Each florin or gilder of the United Netherlands		40
Each mark banco of Hamburg		33⅓
Each rix dollar of Denmark	1	
Each real of plate of Spain		10
Each real of vellon of Spain		5
Each milree of Portugal	1	24
Each tale of China	1	48
Each pagoda of India	1	84
Each rupee of Bengal		50

PROGRESSION

Consists of two parts—ARITHMETICAL and GEOMETRICAL.

ARITHMETICAL PROGRESSION

Is when a rank of numbers increases or decreases regularly, by the continual adding or subtracting of some equal number: As 1, 2, 3, 4, 5, 6, are in Arithmetical Progression by the continual increasing or adding of one, and 11, 9, 7, 5, 3, 1, by the continual decrease or subtraction of two.

NOTE. When any even number of terms differ by Arithmetical Progression, the sum of the two extremes will be equal to the two middle numbers, or any two means equally distant from the extremes: As 2, 4, 6, 8, 10, 12, where 6+8, the two middle numbers are = 12+2, the two extremes, and = 10+4 the two means = 14.

When the number of terms are odd, the double of the middle term will be equal to the two extremes, or of any two means equally distant from the middle term: As 1, 2, 3, 4, 5, where the double of 3=5+1=2+4=6.

In Arithmetical Progression five things are to be observed, viz.

1. The first term.
2. The last term.
3. The number of terms.
4. The equal difference.
5. The sum of all the terms.

Any three of which being given, the other two may be found.

The first, second and third terms given to find the fifth.

RULE. Multiply the sum of the two extremes by half the number of terms, or multiply half the sum of the two extremes by the whole number of terms, the product is the total of all the terms.

EXAMPLES.

1. How many strokes does the hammer of a clock strike in 12 hours? 12+1=13 *then* 13×6=78 Ans.

2. A man buys 17 yards of cloth, and gives for the first yd. 2*s.* and for the last 10*s.* what do the 17 yards amount to?

Ans. £.5 2*s.*

3. If 100 eggs were placed in a right line, exactly a yard asunder from one another, and the first a yard from a basket, what length of ground does that man go who gathers up these 100 eggs singly, returning with every egg to the basket? Ans. 5 miles 1300 yards.

The first, second and third terms given to find the fourth.

RULE. From the second subtract the first, the remainder divided by the third less one gives the fourth.

EXAMPLES.

1. A man had 8 sons, the youngest was 4 years old, and the eldest 32, they increase in Arithmetical Progression; what was the common difference of their ages? Ans. 4.

$32-4=28$ then $28\div 8-1=4$ the common difference.

2. A man is to travel from Boston to a certain place in 12 days, and to go but 3 miles the first day, increasing every day by an equal excess, so that the last day's journey may be 58 miles; what is the daily increase, and how many miles distant is that place from Boston?

Ans. 5 miles daily increase.

Therefore as 3 miles is the first day's journey;

$3+5=$ 8 second ditto.
$8+5=13$ third ditto, &c.

The whole distance is 366 miles.

The first, second and fourth terms given to find the third.

RULE. From the second subtract the first, the remainder divide by the fourth, and to the quotient add 1, gives the third.

EXAMPLES.

1. A person travelling into the country, went 3 miles the first day, and increased every day by 5 miles, till at last he went 58 miles in one day, how many days did he travel?

Ans 12.

$58-3=55$ then $55\div 5=11$ and $11+1=12$ the number of days.

2. A man being asked how many sons he had, said that th e youngest was 4 years old and the eldest 32, and that he increased one in his family every four years; how many had he? Ans. 8.

The second, third and fourth given to find the first.

RULE. Multiply the fourth by the third, made less by 1, the product subtracted from the second gives the first.

EXAMPLES.

1. A man in 10 days went from Boston to a certain town in the country, every day's journey increasing the former by 4, and the last day he went was 46 miles: what was the first? Ans. 10 miles.

$4 \times \overline{10-1} = 36$ then $46-36=10$, the first day's journey.

2. A man takes out of his pocket, at 8 several times, so many different numbers of shillings, every one exceeding the former by 6; the last 46; what was the first? Ans. 4.

The second, third and fifth given to find the first.

RULE. Divide the fifth by the third, and from the quotient subtract half the product of the fourth, multiplied by the third less 1, gives the first.

EXAMPLE.

A man is to receive £.360 at 12 several payments, each to exceed the former by £.4, and is willing to bestow the first payment on any one that can tell him what it is; what will that person have for his pains? Ans. £.8.

$360 \div 12 = 30$ then $30 - \frac{4 \times \overline{12-1}}{2} = 8$, the first payment.

The first, third and fourth given to find the second.

RULE. Subtract the fourth from the product of the third, multiplied by the fourth, that remainder added to the first gives the second.

EXAMPLE.

What is the last number of an Arithmetical Progression, beginning at 6, and continuing by the increase of 8 to 20 places? Ans. 158.

$\overline{20\times8}-8=152$ then $152+6=158$, the last number.

GEOMETRICAL PROGRESSION

Is the increasing or decreasing of any rank of numbers by some common ratio, that is, by the continual multiplication or division of some equal number: As 2, 4, 8, 16, increase by the multiplier 2, and 16, 8, 4, 2, decrease by the divisor 2.

NOTE. When any number of terms is continued in Geometrical Progression, the product of the two extremes will be equal to any two means, equally distant from the extremes: As 2, 4, 8, 16, 32, 64, where $64\times2=4\times32=8\times16=128$.

When the number of terms are odd, the middle term multiplied into itself will be equal to the two extremes, or any two means equally distant from the mean: As 2, 4, 8, 16, 32, where $2\times32=4\times16=8\times8=64$.

In Geometrical Progression the same five things are to be observed as in Arithmetical, viz.

1. The first term.
2. The last term.
3. The number of terms.
4. The equal difference or ratio.
5. The sum of all the terms.

NOTE. As the last term in a long series of numbers is very tedious to come at, by continual multiplication; therefore, for the readier finding it out, there is a series of numbers made use of in Arithmetical Proportion, called indices, beginning with an unit, whose common difference is one; whatever number of indices you make use of, set as many numbers (in such Geometrical Proportion as is given in the question) under them:

As 1, 2, 3, 4, 5, 6 indices.
2, 4, 8, 16, 32, 64 numbers in Geometrical Proportion.

But if the first term in Geometrical Proportion be different from the ratio, the indices must begin with a cypher.

As 0, 1, 2, 3, 4, 5, 6 indices.
1, 2, 4, 8, 16, 32, 64 numbers in Geometrical Proportion.

When the indices begin with a cypher, the sum of the indices made choice of, must be always one less than the number of terms given in the question; for 1 in the indices is over the second term, and 2 over the third, &c.

Add any two of the indices together, and that sum will agree with the product of their respective terms.

As in the first table of indices	2+ 5= 7
Geometrical Proportion	4×32=128
	2+ 4= 6
Then in the second	4×16= 64

If any Geometrical Progression proceeding from unity, the ratio being known, to find any remote term, without producing all the intermediate terms.

RULE. Find what figures of the indices added together would give the exponent of the term wanted, then multiply the numbers standing under such exponent into each other, and it will give the term required.

NOTE. When the exponent one stands over the second term, the number of exponents must be one less than the number of terms.

EXAMPLES.

1. A man agrees for 12 peaches, to pay only the price of the last, reckoning a farthing for the first, a half-penny for the second, &c. doubling the price to the last; what must he give for them?

0, 1, 2, 3, 4 exponents. 16=4
1, 2, 4, 8, 16 number of terms. 16=4

256=8
8=3

4+4+3=11, number of terms less 1,

4)2048=11 num. farth.

12)512

20)42 8

Ans. £.2 2 8

2. A country gentleman, going to a fair to buy some oxen, meets with a person who had 23; he demanding the price of them was answered £.16 apiece; the gentleman bids him

£.15 apiece, and he would buy all; the other tells him it would not be taken, but if he would give what the last ox would come to, at a farthing for the first, and doubling it to the last, he should have all. What was the price of the oxen? Ans. £.4369 1*s.* 4*d.*

In any Geometrical Progression, not proceeding from unity, the ratio being given, to find any remote term, without producing all the intermediate terms.

RULE. Proceed as in the last, only observe that every product must be divided by the first term.

EXAMPLES.

1. A sum of money is to be divided among eight persons, the first to have £.20, the second £.60, and so on in triple proportion: what will the last have?

$$0.\ 1.\ 2.\ 3.\ \frac{540\times540}{20}=14580 \text{ then } \frac{14580\times60}{20}=43740$$
$$20.\ 60.\ 180.\ 540.$$

Ans. £.43740.

3+3+1=7 one less than the number of terms.

2. A gentleman, dying, left 9 sons, to whom and to his executor he bequeathed his estate in the manner following: To his executor £.50; his youngest son was to have as much more as the executor, and each son to exceed the next younger by as much more; what was the eldest son's portion?

Ans. £.25600.

The first term, ratio, and number of terms given, to find the sum of all the terms.

RULE. Find the last term as before, then subtract the first from it, and divide the remainder by the ratio less one, to the quotient of which add the greater, and it gives the sum required.

EXAMPLES.

1. A servant skilled in numbers agreed with a gentleman to serve him 12 months, provided he would give him a farth-

ing for his first month's service, a penny for the second, and 4*d.* for the third, &c.: what did his wages amount to?

256×256=65536, then 65536×64=4194304

0. 1. 2. 3. 4. 4194304—1

1. 4. 16. 64. 256. ——————=1398101, then

(4+4+3=11. No. of terms less 1.) 4—1

1398101+4194304=5592405 farthings.

Ans. £.5825 8*s.* 5¼*d.*

2. A man bought a horse, and by agreement was to give a farthing for the first nail, three for the second, &c.; there were 4 shoes, and in each shoe 8 nails: what was the worth of the horse? Ans. £.965114681693 13*s.* 4*d.*

3. A certain person married his daughter on new-year's day, and gave her husband one shilling towards her portion, promising to double it on the first day of every month for one year: what was her portion? Ans. £.204 15*s.*

4. A laceman, well versed in numbers, agreed with a gentleman to sell him 22 yards of rich gold brocaded lace for 2 pins the first yard, 6 pins the second, &c. in triple proportion. I desire to know what he sold the lace for, if the pins were valued at 100 for a farthing: also, what the laceman got or lost by sale thereof, supposing the lace stood him in £.7 per yard? Ans. The lace sold for £.326886 0*s.* 9*d.*

Gain £.326732 0*s.* 9*d.*

PERMUTATION

Is the changing or varying of the order of things.

RULE. Multiply all the given terms one into another, and the last product will be the number of changes required.

EXAMPLES.

1. How many changes may be rung upon 12 bells, and how long would they be ringing but once over, supposing 10 changes might be rung in one minute, and the year to contain 365 days 6 hours?

1×2×3×4×5×6×7×8×9×10×11×12=479001600 changes, ÷ 10=47900160 minutes, and if reduced is =91 years 3 weeks 5 days and 6 hours.

2. A young scholar, coming into a town for the convenience of a good library, demands of a gentleman with whom he lodged what his diet would cost for a year, who told him £.10; but the scholar, not being certain what time he should stay, asked him what he must give him for so long as he could place his family (consisting of 6 persons beside himself) in different positions every day at dinner; the gentleman, thinking it could not be long, tells him £.5, to which the scholar agrees: what time did the scholar stay with the gentleman? Ans. 5040 days.

EXTRACTION OF THE SQUARE ROOT.

Extracting the Square Root is to find out such a number as being multiplied into itself the product will be equal to the given number.

Rule. 1. Point the given number, beginning at the unit's place, then to the hundred's, and so upon every second figure throughout.

2. Seek the greatest square number in the first point, towards the left hand, placing the square number under the first point, and the root thereof in the quotient; subtract the square number from the first point, and to the remainder bring down the next point, and call that the resolvend.

3. Double the quotient, and place it for a divisor on the left hand of the resolvend; seek how often the divisor is contained in the resolvend, (reserving always the unit's place) and put the answer in the quotient, and also on the right hand side of the divisor; then multiply by the figure last put in the quotient, and subtract the product from the resolvend; bring down the next point to the remainder, (if there be any more) and proceed as before.

Roots.	1.	2.	3.	4.	5.	6.	7.	8.	9.
Squares.	1.	4.	9.	16.	25.	36.	49.	64.	81.

EXAMPLES.

1. What is the square root of 119025?

```
119025(345
  9
 ---
64)290
   256
 ----
685)3425
    3425                    Ans. 345
```

2. What is the square root of 106929? Ans. 327
3. What is the square root of 2268741? Ans. 1506,23+
4. What is the square root of 7596796? Ans. 2756,228+
5. What is the square root of 36372961? Ans. 6031
6. What is the square root of 22071204? Ans. 4698

When the given number consists of a whole number and decimals together, make the number of decimals even, by adding cyphers to them, so that there may be a point fall on the unit's place of the whole number.

7. What is the square root of 3271,4007? Ans. 57,19+
8. What is the square root of 4795,25731? Ans. 69,247+
9. What is the square root of 4,372594? Ans. 2,091+
10. What is the square root of 2,2710957? Ans. 1,50701+
11. What is the square root of ,00032754? Ans. ,01809+
12. What is the square root of 1,270054? Ans. 1,1269+

To extract the square root of a vulgar fraction.

RULE. Reduce the fraction to its lowest terms, then extract the square root of the numerator for a new numerator, and the square root of the denominator for a new denominator.

If the fraction be a surd, (i. e. a number whose root can never be exactly found) reduce it to a decimal, and extract the root from it.

EXAMPLES.

13. What is the square root of $\frac{2304}{5184}$? Ans. $\frac{2}{3}$.
14. What is the square root of $\frac{2704}{4225}$? Ans. $\frac{4}{5}$.
15. What is the square root of $\frac{9216}{12544}$? Ans. $\frac{8}{7}$.

SURDS.

16. What is the square root of $\frac{2}{3}\frac{7}{4}\frac{5}{1}$? Ans. ,89802+
17. What is the square root of $\frac{3}{4}\frac{5}{7}\frac{7}{6}$? Ans. ,86602+
18. What is the square root of $\frac{4}{5}\frac{7}{4}\frac{8}{9}$? Ans. ,93308+

To extract the square root of a mixed number.

RULE. 1. Reduce the fractional part of the mixed number to its lowest term, and then the mixed number to an improper fraction.

2. Extract the roots of the numerator and denominator for a new numerator and denominator.

If the mixed number given be a surd, reduce the fractional part to a decimal, annex it to the whole number, and extract the square root therefrom.

EXAMPLES.

19. What is the square root of $51\frac{3}{8}\frac{1}{5}$? Ans. $7\frac{1}{5}$.
20. What is the square root of $27\frac{8}{1}\frac{}{6}$? Ans. $5\frac{1}{4}$.
21. What is the square root of $9\frac{4}{4}\frac{3}{9}$? Ans. $3\frac{1}{7}$.

SURDS.

22. What is the square root of $85\frac{1}{1}\frac{4}{5}$? Ans. 9,27+
23. What is the square root of $8\frac{5}{7}$? Ans. 2,9519+
24. What is the square root of $6\frac{2}{5}$? Ans. 2,5298+

THE APPLICATION.

1. There is an army consisting of a certain number of men, who are placed rank and file, that is, in the form of a square, each side having 576 men: I desire to know how many the whole square contains? Ans. 331776.

2. A certain pavement is made exactly square, each side of which contains 97 feet: I demand how many square feet are contained therein? Ans. 9409.

To find a mean proportional between any two given numbers.

RULE. The square root of the product of the given number is the mean proportional sought.

EXAMPLES.

1. What is the mean proportional between 3 and 12?
Ans. $3 \times 12 = 36$ then $\sqrt{36} = 6$ the mean proportional.

2. What is the mean proportional between 4276 and 842?
Ans. 1897,4+.

To find the side of a square, equal in area to any given superficies.

RULE. The square root of the content of any given superficies is the square equal sought.

EXAMPLES.

3. If the content of a given circle be 160, what is the side of the square equal? Ans. 12,64911.

4. If the area of a circle is 750, what is the side of the square equal? Ans. 27,38612.

The area of a circle given to find the diameter.

RULE. As 355 : 452, or as 1 : 1,273239 : : the area to the square of the diameter;—or, multiply the square root of the area by 1,12837, and the product will be the diameter.

EXAMPLE.

5. What length of cord will fit to tie to a cow's tail, the other end fixed in the ground, to let her have liberty of eating an acre of grass, and no more, supposing the cow and tail to be 5 yards and a half? Ans. 6,136 perches.

The area of a circle given to find the periphery, or circumference.

RULE. As 113 : 1420, or as 1 : 12,56637 : : the area: square of the periphery; or multiply the square root of the area by 3,5449, and the product is the circumference.

EXAMPLES.

6. When the area is 12, what is the circumference?
Ans. 12,2798.

7. When the area is 160, what is the periphery?
Ans. 44,84.

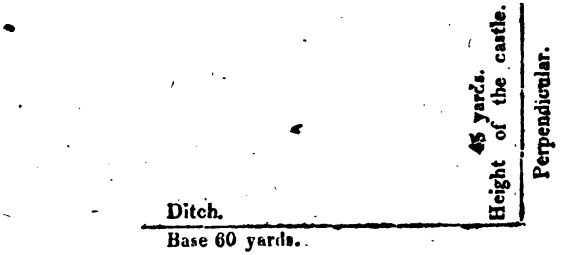
Any two sides of a right angled triangle given to find the third side.

1. The base and perpendicular given to find the hypothenuse.

RULE. The square root of the sum of the squares of the base and perpendicular is the length of the hypothenuse.

EXAMPLES.

8. The top of a castle from the ground is 45 yards high, and is surrounded with a ditch 60 yards broad; what length must a ladder be to reach from the outside of the ditch to the top of the castle? Ans. 75 yards.



9. The wall of a town is 25 feet high, which is surrounded by a moat of 30 feet in breadth: I desire to know the length of a ladder that will reach from the outside of the moat to the top of the wall? Ans. 39,05 feet.

The hypothenuse and perpendicular given to find the base.

RULE. The square root of the difference of the squares of the hypothenuse and perpendicular is the length of the base.

The base and hypothenuse givin to find the perpendicular.

RULE. The square root of the difference of the hypothenuse and base is the height of the perpendicular.

N. B. The two last questions may be varied for examples to the two last propositions.

Any number of men being given to form them into a square battle, or to find the number of ranks and files.

RULE. The square root of the number of men given, is the number of men either in rank and file.

10. An army consisting of 331776 men, I desire to know how many in rank and file? Ans. 576.

11. A certain square pavement contains 48841 square stones, all of the same size: I demand how many are contained in one of the sides? Ans. 221.

EXTRACTION OF THE CUBE ROOT.

To extract the Cube Root is to find out a number which being multiplied into itself, and then into that product, produceth the given number.

RULE. 1. Point every third figure of the cube given, beginning at the unit's place; seek the greatest cube to the first point, and subtract it therefrom; put the root in the quotient, and bring down the figures in the next point to the remainder for a resolvend.

2. Find a divisor by multiplying the square of the quotient by 3. See how often it is contained in the resolvend, rejecting the units and tens, and put the answer in the quotient.

3. To find the *subtrahend*. 1. Cube the last figure in the quotient. 2. Multiply all the figures in the quotient by 3, except the last, and that product by the square of the last. 3. Multiply the divisor by the last figure. Add these products together, gives the subtrahend, which subtract from the resolvend; to the remainder bring down the next point, and proceed as before.

ROOTS.	1.	2.	3.	4.	5.	6.	7.	8.	9.
CUBES.	1.	8.	27.	64.	125.	216.	343.	512.	72

EXAMPLE.

What is the cube root of 99252847?

99252847(463
64=Cube of 4.

Divisor.
Square of 4×3=48)35252 Resolvend.

216=Cube of 6.
432 =4×3×by square of 6.
288 =Divisor × by 6.

33336 Subtrahend.

Divisor.
Sq. of 46×3=6348)1916847 Resolvend.

27=Cube of 3.
1242 =46×3×by square of 3.
19044 =Divisor × by 3.

1916847 Subtrahend.

Another new and more concise method of extracting the Cube Root.

RULE. 1. Point every third figure of the cube given, beginning at the unit's place, then find the nearest cube to the first point, and subtract it therefrom, put the root in the quotient, bring down the figures in the next point to the remainder for a resolvend.

2. Square the quotient and triple the square for a divisor: as, 4×4×3=48. Find how often it is contained in the resolvend, rejecting units and tens, and put the answer in the quotient.

3. Square the last figure in the quotient, and put it on the right hand of the divisor:

As 6×6=36 put to the divisor 48=4836.

4. Triple the last figure in the quotient, and multiply by the former, put it under the other, units under the tens, add them together, and multiply the sum by the last figure in the quotient, subtract that product from the resolvend, bring down the next point, and proceed as before.

EXAMPLES.

1. What is the cube root of 99252847?

Square of $4\times3=48$ divisor. 99252847(463
Square of 6 put to $48=4836$ 64
$6\times3\times4=72$ ——
35252
$5556\times6=$ 33336
Square of $46=2116\times3=6348$ divisor ——
Square of $3=9$ put to $6348=*634809$ 1916847
$3\times3\times46=414$

$638949\times3=1916847$

2. What is the cube root of 389017? Ans. 73.
3. What is the cube root of 5735339? Ans. 179.
4. What is the cube root of 32461759? Ans. 319.
5. What is the cube root of 84604519? Ans. 439.
6. What is the cube root of 259694072? Ans. 638.
7. What is the cube root of 48228544? Ans. 364.
8. What is the cube root of 27054036008? Ans. 3002.
9. What is the cube root of 22069810125? Ans. 2805.
10. What is the cube root of 122615327232? Ans. 4968.
11. What is the cube root of 219365327791? Ans. 6031.
12. What is the cube root of 673373097125? Ans. 8765.

When the given number consists of a whole number and decimal together, make the number of decimals to consist of 3, 6, 9, &c. places, by adding cyphers thereto, so that there may be a point fall on the unit's place of the whole number.

13. What is the cube root of 12,977875? Ans. 2,35
14. What is the cube root of 36155,027576? Ans. 33,06+
15. What is the cube root of ,001906624? Ans. ,124
16. What is the cube root of 33,230979637? Ans. 3.215+
17. What is the cube root of 15926,972504? Ans. 25,16+
18. What is the cube root of ,053258279? Ans. ,376+

* When the quotient is 1, 2 or 3, there must be a cypher put to supply the place of tens.

To extract the cube root of a vulgar fraction.

RULE. Reduce the fraction to its lowest terms, then extract the cube root of the numerator and denominator for a new numerator and denominator; but if the fraction be a surd, reduce it to a decimal, and then extract the root from it.

EXAMPLES.

19. What is the cube root of $\frac{2}{6}\frac{5}{6}\frac{0}{0}$? Ans. $\frac{4}{5}$.
20. What is the cube root of $\frac{3}{1}\frac{2}{5}\frac{4}{0}\frac{}{0}$? Ans. $\frac{3}{5}$.
21. What is the cube root of $\frac{1}{5}\frac{5}{1}\frac{2}{3}\frac{0}{6}$? Ans. $\frac{2}{3}$.

SURDS.

22. What is the cube root of $\frac{4}{7}$? Ans. ,829+
23. What is the cube root of $\frac{5}{9}$? Ans. ,822+
24. What is the cube root of $\frac{2}{3}$? Ans. ,873+

To extract the cube root of a mixed number.

RULE. Reduce the fractional part to its lowest terms, and then the mixed number to an improper fraction; extract the cube roots of the numerator and denominator for a new numerator and denominator: but if the mixed number given be a surd, reduce the fractional part to a decimal, annex it to the whole number, and extract the root therefrom.

EXAMPLES.

25. What is the cube root of $12\frac{1}{2}\frac{9}{7}$? Ans. $2\frac{1}{3}$.
26. What is the cube root of $31\frac{1}{3}\frac{5}{4}\frac{}{3}$? Ans. $3\frac{1}{7}$.
27. What is the cube root of $405\frac{2}{1}\frac{8}{2}\frac{}{5}$? Ans. $7\frac{2}{5}$.

SURDS.

28. What is the cube root of $7\frac{1}{5}$? Ans. 1,93+
29. What is the cube root of $9\frac{1}{8}$? Ans. 2,092+
30. What is the cube root of $8\frac{5}{7}$? Ans. 2,057+

THE APPLICATION.

1. If a cubical piece of timber be 47 inches long, 47 inches broad, and 47 inches deep, how many cubical inches doth it contain? Ans. 103823.

2. There is a cellar dug that is 12 feet every way, in length, breadth and depth: how many solid feet of earth were taken out of it? Ans. 1728.

3. There is a stone of a cubic form, which contains 389017 solid feet: what is the superficial content of one of its sides? Ans. 5329.

Between two numbers given, to find two mean proportionals.

RULE. Divide the greater extreme by the lesser, and the cube root of the quotient multiplied by the lesser extreme gives the lesser mean: multiply the said cube root by the lesser mean, and the product will be the greater mean proportional.

EXAMPLE.

4. What are the two mean proportionals between 6 and 162? Ans. 18 and 54.

5. What are the two mean proportionals between 4 and 108? Ans. 12 and 36.

To find the side of a cube that shall be equal in solidity to any given solid, as a globe, cylinder, prism, cone, &c.

RULE. The cube root of the solid content of any solid body given is the side of the cube of equal solidity.

EXAMPLES.

6. If the solid content of a globe is 10648, what is the side of a cube of equal solidity? Ans. 22.

The side of the cube being given, to find the side of that cube, that shall be double, treble, &c. in quantity to the given cube.

RULE. Cube the side given, and multiply it by 2, 3, &c. the cube root of the product is the side sought.

EXAMPLE.

7. There is a cubical vessel whose side is 12 inches, and it is required to find the side of another vessel that is to contain three times as much? Ans. 17,306.

EXTRACTION OF THE BIQUADRATE ROOT.

To extract the Biquadrate Root is to find out a number, which, being involved four times into itself, will produce the given number.

RULE. First extract the square root of the given number, then extract the square root of that square root, and it will give the biquadrate root required.

EXAMPLES.

1. What is the biquadrate of 27? Ans. 531441.
2. What is the biquadrate of 76? 33362176.
3. What is the biquadrate of 275? 5719140625.
4. What is the biquadrate root of 531441? 27.
5. What is the biquadrate root of 33362176? 76.
6. What is the biquadrate root of 5719140625? 275.

A GENERAL RULE

FOR EXTRACTING THE ROOTS OF ALL POWERS.

1. Prepare the number given for extraction, by pointing off from the unit's place, as the root required directs.

2. Find the first figure in the root, by a table of powers, which subtract from the given number.

3. Bring down the first figure in the next point to the remainder, and call it the dividend.

4. Involve the root into the next inferior power to that which is given; multiply it by the given power, and call it the divisor.

5. Find a quotient figure by common division, and annex it to the root; then involve the whole root into the given power, and call that the subtrahend.

6. Subtract that number from as many points of the given power as is brought down, beginning at the lowest place, and to the remainder bring down the first figure of the next point for a new dividend.

7. Find a new divisor, and proceed in all respects as before.

EXAMPLES.

1. What is the square root of 141376?

141376(376
9

6)51 dividend. $3\times2=6$ divisor.
$37\times37=1369$ subtrahend.
1369 subtrahend. $37\times2=74$ divisor.
$376\times376=141376$ subtrahend.
74)447 dividend.

141376 subtrahend. Ans. 376.

2. What is the cube root of 53157376?

53157376(376
27

27)261 dividend. $3\times3\times3=37$ divisor.
$37\times37\times37=5065$ subtrahend.
50653 subtrahend $37\times37\times3=4107$ divisor.
$376\times376\times376=53157376$ subtrahend.
4107)25043 dividend.

53157376 subtrahend. Ans. 376.

3. What is the biquadrate root of 19987173376?

19987173376(376
81

108)1188 dividend.

1874161 subtrahend.

202612) 1245563 dividend.

19987173376 subtrahend.

3 × 3 × 3 × 4 = 108 divisor.
37 × 37 × 37 × 37 = 1874161 subtrahend.
37 × 37 × 37 × 4 = 202612 divisor.
376×376×376×376= 19987173376 subtrahend.
Ans. 376.

DUODECIMALS.

Duodecimals, or Cross Multiplication, is a rule made use of in measuring and computing the dimensions of the several parts of buildings; it is likewise used to find ships' tonnage and the contents of bales, cases, &c.

Dimensions are taken in feet, inches and parts.

Artificers' work is computed by different measures, viz.

Glazing, and masons' flat work, by the foot.

Painting, paving, plastering, &c. by the yard.

Partitioning, flooring, roofing, tiling, &c. by the square of 100 feet.

Brick-work, &c. by the rod of 16½ ft. whose square is 272¼

The contents of bales, cases, &c by the ton of 40 cubic feet.

The tonnage of ships, by the ton of 95 feet.

RULE FOR MULTIPLYING DECIMALLY.

1. Under the multiplicand write the corresponding denominations of the multiplier.

2. Multiply each term in the multiplicand (beginning at the lowest) by the feet in the multiplier; write each result under each respective term, observing to carry an unit from each lower denomination to its superior.

3. In the same manner, multiply the multiplicand by the inches in the multiplier, and write the result of each term, one place more to the right hand of them, in the multiplicand.

4. Work in the same manner with the other parts in the multiplier, setting the result of each term two places to the right hand of those in the multiplicand, and so on for thirds, fourths, &c.

5. Proceed in the like manner with all the rest of the denominations, and their sum will give the answer required.

EXAMPLES.

1. Multiply 4 feet 9 inches by 8 inches.

ft.	*in.*
4	9
	8
3	2

Ans. 3 feet 2 inches.

2. Multiply 9 feet 6 inches by 4 feet 9 inches.

		ft.	*in.*
		9	6
		4	9
ft.	*in.*		
9	6×4 feet=	38	0
9	6×9 in. =	7	1 6
		45	1 6

Ans. 45 feet 1 inch and 6 twelfths.

3. What is the price of a marble slab, whose length is 5 feet 7 inches, and breadth 1 foot 10 inches, at 1 dollar per foot? Ans. 10 dols. 23 cents 6 mills.

4. There is a house with three tiers of windows, 3 in a tier; the height of the first tier is 7 feet 10 inches, of the second 6 feet 8 inches, and of the third 5 feet 4 inches, and the breadth of each is 3 feet 11 inches; what will the glazing come to, at 14*d.* per foot?

Ans. £.13 11*s.* 10½*d.*

5. If a house measures within the walls 52 feet 8 inches in length, and 30 feet 6 inches in breadth, and the roof be of a true pitch or the rafters ¾ of the breadth of the building, what will its roofing come to at 10*s.* 6*d.* per square?

Ans. £.12 12*s.* 11½*d.*

APPLICATION OF DUODECIMALS.

To find how many cubic or solid square feet (in order to ascertain the freight) are contained in cases, bales, &c. that is, how many cubic feet they will take up in a ship.

EXAMPLES.

1. Suppose the dimensions of a bale to be 7 feet 6 inches, 3 feet 3 inches, and 1 foot 10 inches: what is the solid content?

				ft.	*in.*		
				7	6		
				3	3		
ft.	*in.*						
7	6	× 3 ft.	=	22	6		
7	6	× 3 in.	=	1	10	6	
				24	4	6	
				1	10		
ft.	*in.*	*tw.*					
24	4	6 × 1 ft.	=	24	4	6	
24	4	6 × 10 in.	=	20	3	9	
				44	8	3	

Ans. 44 feet 8 inches and 3 twelfth parts.

2. What is the freight of a bale containing 65 feet 9 inches, at 15 dollars per ton of 40 feet?

		dols. cts.	Decimally.
		15,00 for 40 feet.	65,75
20 ft.	$\frac{1}{2}$	7,50	15
5 ft.	$\frac{1}{4}$	1,87,5	
6 in.	$\frac{1}{10}$	,18,7	32875
3	$\frac{1}{2}$	,09,3	6575
		24,65,5	40)986,25
			24,65,6

Ans. 24 dols. 65½ cts.

3. A merchant imports from London 6 bales of the following dimensions, viz.

	Length. *ft. in.*	Height. *ft. in.*	Depth. *ft. in.*
No. 1.	2 10	2 4	1 9
2.	2 10	2 6	1 3
3.	3 6	2 2	1 8
4.	2 10	2 8	1 9
5.	2 10	2 6	1 9
6.	2 11	2 8	1 8

What are the solid contents, and how much will the freight amount to, at 20 dols. per ton?

The contents are viz.

	ft.	*in.*	*feet.*
No. 1.	11	7	71,58
2.	8	10	20 dols. per ton.
3.	12	7	
4.	13	2	40)1431,60
5.	12	5	
6.	13	0	35,79
	71	7	

Ans. 35 dols. 79 cts.

To find Ships' Tonnage by Carpenters' Measure.

RULE. For single decked vessels, multiply the length, breadth at the main beam, and depth of the hold, together, and divide the product by 95.

EXAMPLE.

What is the tonnage of a single decked vessel, whose length is 60 feet, breadth 20 feet, and depth 8 feet?

60 length.
20 breadth.

1200
8 depth.

95)9600(101$\frac{5}{95}$
95

100
95

5 Ans. 101$\frac{5}{95}$ tons.

This is the usual method of tonnaging a single decked vessel having the deck bolted to the wale. But if it be required that the deck be bolted at any height above the wale, the custom is to pay the carpenter for one half of the additional height, to which the deck may be thus raised; that is, one half of the difference being added to the former depth gives the depth to be used in calculating the tonnage.

EXAMPLE.

A merchant, after having contracted with a carpenter to build a single decked vessel of 60 feet keel, 20 feet beam, and 8 feet hold, desires that the deck be laid for 10 feet hold: required the tonnage to be paid for?

60 length.
20 breadth.

1200
1=$\frac{1}{2}$ difference of depth+8=9

95)10800(113$\frac{85}{95}$
95

130
95

350
285

65 Ans. 113$\frac{85}{95}$ tons.

RULE. For a double decked vessel, take half the breadth of the main beam for the depth of the hold, and work as for a single decked vessel.

EXAMPLES.

1. What is the tonnage of a double decked vessel, whose length is 65 feet, and breadth 21 feet 6 inches?

```
                    65     length.
                    21  6  breadth.
                   ----
                    65
                   130
65 feet × 6 inches =  32  6
                   ------
                  1397  6
                    10  9  depth.
                  -------
1397 ft. 6 in. × 10 ft. = 13975  0
1397 ft. 6 in. ×  9 in. =  1048  1
                          -------
                 95)15023  1(158 13/95
                    95
                   ----
                    552
                    475
                   ----
                     773
                     760
                   ----
                      13          Ans. 158 13/95 tons.
```

The preceding question may be wrought thus:

```
                    65
                    21 6
                   ----
                    65
                   130
                  ----
                  1365
          6 1/2     32 6
                  ----
                  1397 6
                    10 9
                  -----
                 13975 0
          6 1/2     698 9
          3 1/2     349 4
                  -----
                 95)15023 1 as before.
                  -----
                 158 13/95 tons.
```

2. What will the above tonnage amount to, at 16 dols. per ton?

		dols.
158		16
16		13
948		48
158		16
2,18		
2530,18	95)208(2,18	
	190	
	180	
	95	
	850	
	760	
	90	

Ans. 2530 dols. 18 cents.

3. Required the tonnage of a ship of 74 feet keel, and 26 feet 6 inches beam. Ans. $273\frac{11}{95}$ tons.

To find the Government Tonnage.

"If the vessel be double decked, take the length thereof from the fore part of the main stem, to the after part of the stern post, above the upper deck; the breadth thereof at the broadest part above the main wales, half of which breadth shall be accounted the depth of such vessel, and then deduct from the length, three-fifths of the breadth, multiply the remainder by the breadth, and the product by the depth, and divide this last product by 95, the quotient whereof shall be deemed the true contents or tonnage of such ship or vessel; and if such ship or vessel be single decked, take the length and breadth, as above directed, deduct from the said length

three fifths of the breadth, and take the depth from the under side of the deck plank, to the ceiling in the hold, then multiply and divide as aforesaid, and the quotient shall be deemed the tonnage."

EXAMPLES.

1. What is the government tonnage of a single decked vessel, whose length is 69 feet 6 inches, breadth 22 feet 6 inches, and depth 8 feet 6 inches?

ft.	*in.*				
69	6	length.		22	6 breadth.
deduct 13	6	for $\frac{3}{5}$ breadth.		3	
56	0			5)67	6
22	6	breadth.		13	6
112	0				
112					
6 in. $\frac{1}{2}$ 28	0				
1260	0				
8	6	depth.			
10080	0				
6 in. $\frac{1}{2}$ 630	0				

95)10710 0(112$\frac{70}{95}$ tons.
95

121
95

260
190

70

Ans. 112$\frac{70}{95}$ tons

2. What is the government tonnage of a double decked vessel, of the following dimensions; length 75 feet 6 inches, breadth 23 feet 4 inches, and depth 11 feet 8 inches?

ft.	*in.*					
75	6					
14	0	for $\frac{2}{3}$ breadth.				
61	6					
23	4	breadth.				
183			61 ft. × 23 ft. =	1403	0	
122			6 in. × 23 ft. =	11	6	
6 in. $\frac{1}{2}$ 11	6	61 ft. 6 in. ×	4 in. =	20	6	
4 in. $\frac{1}{3}$ 20	6					
1435	0					
11	8	depth.				
15785	0		1435 ft. × 8 in. =	956	8	
6 in. $\frac{1}{2}$ 717	6					
2 in. $\frac{1}{3}$ 239	2					
16741	8					

Or,

ft.	*in.*	
75	6	
14	0	
61	6	
23	4	
1435	0	
11	8	
15785		
16741	8	as before.

95)16741 8(176$\frac{8}{95}$ tons.
95

724
665

591
570

21

Ans. 176$\frac{8}{95}$ tons.

3. What is the government tonnage of a double decked vessel, of the following dimensions; length 82 feet 3 inches, breadth 24 feet 3 inches, and depth 12 feet 1$\frac{1}{2}$ inches?

Ans. 209$\frac{13}{95}$ tons.

TABLES OF CORDAGE.

A CORDAGE TABLE, *shewing how many fathoms, feet and inches of a Rope, of any size, not more than* 14 *inches, mak a hundred weight; with the use of the table.*

Inches.	Fathoms	Feet.	Inches.	Inches.	Fathoms	Feet.	Inches.	Inches.	Fathoms	Feet.	Inches.	Inches.	Fathoms	Feet.	Inches.
1	486	0	0	4¼	26	5	3	7½	8	4	0	10¾	1	1	8
1¼	313	3	0	4½	24	0	0	7¾	8	3	6	11	4	0	3
1½	216	3	0	4¾	21	3	0	8	7	3	6	11¼	3	5	7
1¾	159	3	0	5	19	3	0	8¼	7	0	8	11½	3	4	1
2	124	3	0	5¼	17	4	0	8½	6	4	3	11¾	3	3	3
2¼	96	2	0	5½	16	1	0	8¾	6	2	1	12	3	2	3
2½	77	3	0	5¾	14	4	6	9	6	0	0	12¼	3	2	1
2¾	65	4	0	6	13	3	0	9¼	5	4	0	12½	3	2	0
3	54	0	0	6¼	12	2	0	9½	5	2	0	12¾	2	7	8
3¼	45	5	2	6½	11	3	0	9¾	5	0	6	13	2	5	3
3½	39	3	0	6¾	10	4	0	10	4	5	0	13¼	2	4	9
3¾	34	3	9	7	9	5	6	10¼	4	4	1	13½	2	4	0
4	30	1	6	7¼	9	1	6	10½	4	2	2	13¾	2	3	6
												14	2	2	1

USE OF THE TABLE.

At the top of the table, marked inches, fathoms, feet, inches, the first column is the thickness of the rope in inches and quarters, and the other three the fathoms, feet and inches, that make up a hundred weight of such a rope. One example will make it plain:

Suppose you desire to know how much of a seven-inch rope will make a hundred weight; find 7 in the third column under inches, or thickness of rope, and against it in the fourth column you find 9, 5, 6, which shews that there will be 9 fathoms, 5 feet, 6 inches required to make up one hundred weight.

A TABLE, *shewing the weight of any Cable or Rope of* 120 *fathoms in length, and for every half inch, from* 3 *to* 24 *inches in circumference.*

Inches	Cwt.	Qrs	Inches	Cwt.	Qrs.	Inches	Cwt.	Qrs.	Inches	Cwt.	Qrs.	Inches	Cwt.	Qrs.
3	2	1	7	12	1	11	30	1	15½	60	0	20	100	0
3½	3	0	7½	14	0	11½	33	0	16	64	0	20½	105	0
4	4	0	8	16	0	12	36	0	16½	68	0	21	110	1
4½	5	0	8½	18	0	12½	39	0	17	72	1	21½	115	2
5	6	1	9	20	1	13	42	1	17½	76	2	22	121	0
5½	7	2	9½	22	2	13½	45	2	18	81	0	22½	126	2
6	9	0	10	25	0	14	49	0	18½	85	2	23	132	1
6½	10	2	10½	27	2	14½	52	2	19	90	1	23½	138	0
						15	56	1	19½	95	0	24	144	0

USE OF THE TABLE.

The first column, marked for inches, is the thickness or circumference of the cable to every half inch from 3 to 24 inches; the second, marked cwt. qrs. for the hundred weights and quarters that it will weigh if 120 fathoms in length.

For instance: Suppose it be a cable of 14½ inches; look against 14½ and you will find in the other column 52 cwt. 2 qrs. which shews that 120 fathoms of 14½ inch cable will weigh 52 cwt. 2 qrs. and so in others; and any quantity of a less length will weigh in proportion.

A ship was brought to anchor in a gale of wind, but the gale increasing, it was thought safest to cut the cables, in consequence of which 75 fathoms of 16 inches and 50 fathoms of 12 inches were lost; what must they be valued at in calculating the average; new cordage being then 14 dollars per cwt.

CALCULATION.

120 fath. 16 in. cable=64 cwt.		120 fath. 12 in. cab.=36 cwt.
60 do.	32	40 do. 12
15 do.	8	10 do. 3
75 fath weighing	40	50 fath. weighing 15
50 do.	15	

	dls.	cts.
55 cwt. at 14 dls. per cwt.	770	00
One third deduoted for new	256	66⅔
Ans. dols.	513	33⅓

TABLES OF GOLD COIN

A TABLE

For receiving and paying the Gold Coins of Great Britain and Portugal, of their present standard, at 100 cents for 27 grains. According to an Act of Congress, passed April 29, 1816.

grs.	cts.	dwt.	dls.	cts.	dwt.	dls.	cts.	dwt.	dls.	cts.
1	4	7	6	22	39	34	67	70	62	22
2	7	8	7	11	40	35	55	71	63	11
3	11	9	8	00	41	36	44	72	64	00
4	15	10	9	89	42	37	33	73	64	89
5	19	11	9	78	43	38	22	74	65	78
6	22	12	10	67	44	39	11	75	66	67
7	26	13	11	55	45	40	00	76	67	55
8	30	14	12	44	46	40	89	77	68	44
9	33	15	13	33	47	41	78	78	69	33
10	37	16	14	22	48	42	67	79	70	22
11	41	17	15	11	49	43	55	80	71	11
12	44	18	16	00	50	44	44	81	72	00
13	48	19	16	89	51	45	33	82	72	89
14	52	20	17	78	52	46	22	83	73	78
15	56	21	18	67	53	47	11	84	74	67
16	59	22	19	55	54	48	00	85	75	55
17	63	23	20	44	55	48	89	86	76	44
18	67	24	21	33	56	49	78	87	77	33
19	70	25	22	22	57	50	67	88	78	22
20	74	26	23	11	58	51	55	89	79	11
21	78	27	24	00	59	52	44	90	80	00
22	81	28	24	89	60	53	33	91	80	89
23	85	29	25	78	61	54	22	92	81	78
24	89	30	26	67	62	55	11	93	82	67
		31	27	55	63	56	00	94	83	55
dwt.	dls. cts.	32	28	44	64	56	89	95	84	44
1	89	33	29	33	65	57	78	96	85	33
2	1 78	34	30	22	66	58	67	97	86	22
3	2 67	35	31	11	67	59	55	98	87	11
4	3 55	36	32	00	68	60	44	99	88	00
5	4 44	37	32	89	69	61	33	100	88	89
6	5 33	38	33	78						

A TABLE

For receiving and paying the Gold Coins of France, of their present standard, at 100 *cents for* 27½ *grains. According to an Act of Congress passed April* 29, 1816.

grs.	*cts.*	*dwt.*	*dls.*	*cts.*	*dwt.*	*dls.*	*cts.*	*dwt.*	*dls.*	*cts.*
1	4	7	6	11	39	34	03	70	61	07
2	7	8	6	98	40	34	90	71	61	95
3	11	9	7	85	41	35	77	72	62	82
4	15	10	8	73	42	36	65	73	63	69
5	18	11	9	60	43	37	52	74	64	57
6	22	12	10	47	44	38	39	75	65	44
7	25	13	11	34	45	39	26	76	66	31
8	29	14	12	21	46	40	13	77	67	18
9	33	15	13	09	47	41	01	78	68	05
10	36	16	13	96	48	41	88	79	68	93
11	40	17	14	83	49	42	75	80	69	80
12	44	18	15	71	50	43	63	81	70	67
13	47	19	16	58	51	44	50	82	71	55
14	51	20	17	45	52	45	37	83	72	42
15	55	21	18	32	53	46	24	84	73	29
16	58	22	19	19	54	47	11	85	74	16
17	62	23	20	07	55	47	99	86	75	03
18	65	24	20	94	56	48	86	87	75	91
19	69	25	21	81	57	49	73	88	76	78
20	73	26	22	69	58	50	61	89	77	65
21	76	27	23	56	59	51	48	90	78	53
22	80	28	24	43	60	52	35	91	79	40
23	83	29	25	30	61	53	22	92	80	27
24	87	30	26	17	62	54	09	93	81	14
		31	27	05	63	54	97	94	82	01
dwt.	*dls.cts.*	32	27	92	64	55	84	95	82	89
1	87	33	28	79	65	56	71	96	83	76
2	1 75	34	29	67	66	57	59	97	84	63
3	2 62	35	30	54	67	58	46	98	85	51
4	3 49	36	31	41	68	59	33	99	86	38
5	4 36	37	32	28	69	60	20	100	87	25
6	5 23	38	33	15						

A TABLE

For receiving and paying the Gold Coins of Spain, and the dominions of Spain, of their present standard, at 100 cents for 28¼ grains. According to an Act of Congress, passed April 29, 1816.

grs.	cts.	dwt.	dls.	cts.	dwt.	dls.	cts.	dwt.	dls.	cts.
1	3	7	5	88	39	32	76	70	58	80
2	7	8	6	72	40	33	60	71	59	64
3	11	9	7	56	41	34	44	72	60	48
4	14	10	8	40	42	35	28	73	61	32
5	17	11	9	24	43	36	12	74	62	16
6	21	12	10	08	44	36	96	75	63	00
7	25	13	10	92	45	37	80	76	63	84
8	28	14	11	76	46	38	64	77	64	68
9	31	15	12	60	47	39	48	78	65	52
10	35	16	13	44	48	40	32	79	66	36
11	39	17	14	28	49	41	16	80	67	20
12	42	18	15	12	50	42	00	81	68	04
13	45	19	15	96	51	42	84	82	68	88
14	49	20	16	80	52	43	68	83	69	72
15	53	21	17	64	53	44	52	84	70	56
16	56	22	18	48	54	45	36	85	71	40
17	59	23	19	32	55	46	20	86	72	24
18	63	24	20	16	56	47	04	87	73	08
19	67	25	21	00	57	47	88	88	73	92
20	70	26	21	84	58	48	72	89	74	60
21	73	27	22	68	59	49	56	90	75	76
22	77	28	23	52	60	50	40	91	76	44
23	81	29	24	36	61	51	24	92	77	28
24	84	30	25	20	62	52	08	93	78	12
		31	26	04	63	52	92	94	78	96
dwt.	dls. cts.	32	26	88	64	53	76	95	79	80
1	84	33	27	72	65	54	60	96	80	64
2	1 68	34	28	56	66	55	44	97	81	48
3	2 52	35	29	40	67	56	28	98	82	32
4	3 36	36	30	24	68	57	12	99	83	16
5	4 20	37	31	08	69	57	96	100	84	00
6	5 04	38	31	92						

NOTE.—The Act of Congress, on which the foregoing tables were calculated, expired on the first Nov. 1819, when all Foreign Gold Coins ceased to be a lawful tender.

MERCANTILE PRECEDENTS.

BILL OF EXCHANGE.

Salem, September 12, 1822.

EXCHANGE for £.1000 sterling.

At twenty days sight of this my first of exchange (second and third of the same tenor and date not paid) pay to John Parker, or order, one thousand pounds sterling, with or without further advice from

Your humble servant,
WILLIAM PEABODY.

Messrs. DUTTON & GREEN,
Merchants,
London.

BILL OF GOODS.

At an advance on the sterling cost.

Boston, Oct. 5, 1822.

Mr. WILLIAM POOLE

Bought of SIMON SIMMONDS,

32 ells Mode	1*s.* 8*d.* sterl.	£.2	13	4
64 yds. striped Nankins	1*s.* 6*d.*	4	16	0
28 do. striped Calico	1*s.* 9*d.*	2	9	0
4 pieces Russel	24*s.*	4	16	0
	Sterling	14	14	4
	Exchange, 33⅓ per cent.	4	18	1¼
		£.19	12	5¼
	Advance at 20 per cent.	3	18	5¾
		£.23	10	11

Dollars 78,48

Received his note at 2 months,

SIMON SIMMONDS.

PROMISSORY NOTE.

Boston, Oct. 5, 1822. For value received I promise to pay to Simon Simmonds, or order, seventy eight dollars forty eight cents, on demand, with interest after two months.

Attest. WILLIAM POOLE.

SAUL JAMES.

A RECEIPT FOR AN ENDORSEMENT ON A NOTE.

Boston, Dec. 12, 1822. Received from Mr. William Poole, (by the hands of Mr. Benjamin Flint,) thirty eight dollars, seventy cents, which is endorsed on his note of Oct. 5, 1822.

SIMON SIMMONDS.

38 dols. 70 cts.

RECEIPT FOR MONEY RECEIVED ON ACCOUNT.

Boston, January 10, 1804. Received from Mr. D. Evans, (by the hands of Mr. Thomas Dunmore) four hundred and thirty dollars on account. GEORGE PAGE.

430 dols.

PROMISSORY NOTE BY TWO PERSONS.

Salem, July 12, 1822. For value received we jointly and severally promise to pay to Mr. Samuel Rich, or order, five hundred dollars fifty four cents, on demand, with interest.

NATHAN SAYBORN.

Attest. STEPHEN NEEDY.

WILLIAM BOLTON.

GENERAL RECEIPT.

New-Bedford, March 27, 1822. Received from Mr. N. B. the sum of ten dollars twenty nine cts. in full of all demands.

10 dols. 29 cts. E. D.

BILL OF PARCELS.

Salem, June 20, 1804.

Mr. William Holman

Bought of Daniel Green,

8 hhds. sugar, wt. viz.

	C.	q.	lb.		C.	q.	lb.
No. 1.	5	2	7	No. 5.	5	3	19
2.	5	1	22	6.	5	1	7
3.	6	0	13	7.	5	1	07
4.	5	2	13	8.	5	3	14
	22	2	27		22	2	1
	22	2	1				
	45	1	0				
Tare 12 per cwt.	4	3	11				
Neat	40	1	17 at 12 dls. per cwt.			dols.	cts. 484 82

2 bbls. sugar, viz.

	C.	q.	lb.
	2	2	25
	1	3	17
	4	2	14
Tare 21 lb. per bbl.		1	14
Neat	4	1	0 at 10 dols. 42 50

	gals.		
3 hhds. molasses viz.	101—9*		
	108—5		
	107—7		
	316—21		
	21		
295 gallons at 50 cts.			147 50
1 quarter cask Malaga wine			25 00
5 cases gin, at 4 dols. 25 cts.			21 25
		dols.	721 07

* The ullage is thus noted.

INVOICES.

Invoice of 20 hhds. clayed sugar and 10 hhds. coffee, shipped by of Boston, in the United States of America, on his own account and risk, on board the ship, A B master, bound for and a market, consigned to the said A B for sales and returns, viz.

20 hhds. clayed sugar, viz.

B. C.	No.	C.	q.	lb.	No.	C.	q.	lb.
No. 1 a 20	1.	11	3	14	11.	12	0	14
	2.	10	3	21	12.	10	2	14
	3.	11	0	0	13.	10	2	21
	4.	12	1	0	14.	11	3	21
	5.	11	1	14	15.	10	1	14
	6.	10	3	7	16.	10	2	0
	7.	10	2	0	17.	11	2	21
	8.	11	0	7	18.	10	1	14
	9.	11	0	21	19.	11	1	7
	10.	10	0	7	20.	10	3	14
		111	0	7		110	2	0
		110	2	0				
		221	2	7				
Tare 12 per cwt.		23	2	27				
		197	3	8 neat, at 10 d. 25 c.				dls. cts. 2027 67

10 hhds. coffee, wt. viz.

B. C.	No.	C.	q.	lb.	Tare.	No.	C.	q.	lb.	Tare.
No. 1 a 10	1.	9	2	7	108	6.	6	1	14	79
	2.	9	3	0	112	7.	6	1	6	61
	3.	10	1	21	106	8.	8	2	4	84
	4.	10	2	14	103	9.	9	1	8	91
	5.	8	0	14	94	10.	10	0	14	108
		48	2	0	523		40	2	18	423
		40	2	18	423					
		89	0	18	=946					
		deduct tare			946					
					9040 lb. neat, at 21 cts.					1898 40
										3926 07
Premium of insuring 4176 dols. 67 cts. at 6 per cent. to cover the amount										250 60
Boston, &c.										dols. 4176 67

INVOICE.

Invoice of merchandise on board the brig Swan, A. B. master, shipped by A. M. on his own account and risk, for the West-Indies, and consigned to said master for sales and returns, viz.

			dols.	*dols.*	
	140 M.	boards and plank,	10	1400	
	20 M.	white-oak hhd. staves	30	600	
	12 M.	red-oak hhd. do.	12	144	
	130 M.	shingles - -	3	390	
B. No. 1–18.	18 hhds.	of cod-fish, 17303 lb.	4 pr. C.	692	12
B. No. 1–52.	52 bbls.	of beef - -	12	624	
E. No. 1–30.	30 bbls.	of salmon - -	10	300	
F. No. 1—2.	2 bbls.	pork - -	18	36	
L. No. 1—7.	7 casks	of rice, neat 39 C 3 qrs. 21 lb.	4 pr. C.	159	75
	3 M.	of hoops - -	25	75	
	1300 pair	of shoes -	50 cts.	650	
			dols.	5070	87

Salem, Sept. 7, 1822.

Errors excepted.

A. M.

Mr. Abraham Jones to Walter Brown, *Dr.*

1822.

May	5.	For 1	barrel of flour - -	dols.	10	
	8.	4	lb. coffee - -	2*s.*	1	33
	9.	9	lb. of sugar	11*d.*	1	37
	23.	7	gallons of molasses	3*s.* 9*d.*	4	37
June	7.	3	quintals of fish	15*s.*	7	50
	16.	2	lb. hyson tea -	8*s.* 6*d.*	2	83
July	25.	5	lb. chocolate -	1*s.* 6*d.*	1	25
Aug.	5.	2	bushels of corn	4*s.* 9*d.*	1	58
				dols.	30	23

Errors excepted.

ACCOUNTS OF SALES.

SALES of 20 hhds. 7 bbls. and 31 bags coffee, for and on risk of Mr. William Stillman, merchant, in Portland.

1822.				
March 15.	William Edes, 20 hhds. wt. 14376 lb at 23 cts per lb.		dols.	3306 48
16.	George Watts, 7 bbls. wt. 1493 lb. at 23 cts.			343 39
17.	Peter Bates, 31 bags, " 5507 " 23 cts.			1266 61
				4916 48
Charges.				
	Advertising - - - - -	dols. 1 50		
	Storage - - - - -	3 50		
	Commission on 4916 dols. 48 cts. at 2½ per cent.	122 91		127 91
	Neat proceeds passed to his credit, Errors excepted, &c.		dols.	4788 57

SALES of sundry merchandise received per ship Juno, Captain Dane, from Machias, and disposed of for account and risk of Amos Goodwin, merchant, there.

Date.	*To whom sold.*	*quintals fish.*	*barrels oil.*	*bbls. salmon.*	*bbls. herring.*	*cords wood.*	*cords bark*	*feet boards.*	*barrels beef.*	*Price.*	*Amount.*
1822.										*dls. cts*	*dls. cts.*
June 4	James Yates	30								3	90
8	Wm. Roe	120								3 27	292 40
27	John Payson		6							12	72
July 4	James Nugent						22			4	88
	Cash			50						8 75	437 50
8	Simon Sands							3,216		6 50	20 90
21	Stock								15	9	135
29	Paul Simson					13				3 50	45 50
Aug. 5	John. Rose							1,259		6	7 55
	Taken to fill up		1								
		150	7	50		13	22	4,475	15		1288 85

Remaining unsold, 40 barrels of herring.

Charges, viz.

Storage of fish - - - - -	dols	10 50	
Commission on 1288 dols. 85 cts. at 2½ per ct.		32 22	42 72
Neat proceeds, carried to the credit of his account, Errors excepted, &c.		dols.	1246 13

SALES of 19 hhds. and 7 bbls. of rum, received per brig Ruby, John Butler, master, from Portland, for account and risk of Daniel Edwards, merchant, there.

Date.	*To whom sold.*	*19 hhds. rum.*	*7 bbls. rum.*	*Gallons.*	*Price.*	*Contents.*	*Amount.*
1822.					*cts.*		*dols. cts*
Sep. 24	By Walter King		1	29½	100		29 50
June 2	By David Jones	2		216	100	110 and 106	216
20	By James Ray	4		438	96	108.110.111.109	420 48
24	By Aaron Judson		3	81	95	26½,27½,27	76 95
July 23	By John Davis	1		115	95½		109 82
Aug. 3	By Parsons & Ely		1	25	95½		23 87
23	By Simon Sands	2		222	98	109 113	217 56
Oct. 4	By Moses Young	1	1	128	96	110 28	132 48
10	By Isaac Black	3	1	342½	99	107 104,103,28½	339 07
25	By Amos Dundas	6		632	98½	109,102,106 111,112, 9	662 52
		19	7	2239			2188 25

Charges,

	dls. cts.	*dls. cts.*
Paid Capt. Butler freight of 19 hhds. rum, at	2 50	47 50
ditto 7 bbls.	66	4 62
Porterage 19 hhds.	40	7 60
do. 7 bbls	10	70
Gauging 26 casks	12½	3 25
Cooperage 3 dols. on hhds. 1 dol 50 cts. on bbls.		4 50
Advertising		1 50
Commission on 2188 dols. 25 cts. at 5 per cent.		106 41
		179 08
Neat proceeds		dols. 2009 17

Outstanding in hands of

	dols.	*cts.*
Moses Young	339	7
Amos Dundas	622	52

Salem, September 22, 1822.

Errors excepted, &c.

SALES of the ship Hiram's Cargo, by William Sutton.

1821.		lb.	liv.		liv. sol. den.	liv. sol. den.
Sept. 24. 65 hds.	fish, wt. nt.	72587	at 33 pr. 100		23953 14 2	
6	do.	6515	32 do.		2084 16 0	
2	do.	2126	31 do.		662 3 2	
34	do.	36658	30 do.		10997 8 0	
2	do. part. dam.	2184	sold at auc.		for 226 0 0	
109						37924 1 4
		liv.	*sol.*	*den.*		
24 bbls	beef, at	101	1	3 pr. bbl.	2425 10 0	
7	do.	93	8	5 do.	695 18 11	
29	do.	90	15	0 do.	2631 15 0	
4	do.	83	0	0 do.	333 0 0	
64						6085 3 11
			liv.	*sol.*		
13 bbls.	pork -		136	0	1768 0 0	
25 do.	porter -		80	0	2000 0 0	
3 box.	lin. con. 169 piec.		96	0 per ps	16224 0 0	
14 firk.	butter, wt. 1129 lb.		2	5 per lb.	2540 5 0	
5 thousand	hoops -		240	per M	1200 0 0	
59 do.	shingles		16	do.	944 0 0	
35949 feet	boards -		120	do.	1913 17 7	
170	shaken hhds. -		8½	per hhd	1402 10 0	
						27992 12 7
						72001 17 10
Commission on 72001		liv.	17	10, at 5 per cent		3600 1 10
					liv.	68401 16 0

Errors excepted, &c.

Disbursements, Duties, &c. paid on ship Hiram, by Wm. Sutton.

1822.		liv.	s.	d.	liv.	s.	d.
Sept. 18.	Paid for a barrel of flour - -	86	10	0			
	to the admiralty - -	240	11	6			
	for fresh meat - - -	56	19	5			
	for flats to unload with -	341	13	6	725	7	5
	Paid to the harbour master -	66	10	4			
	for storage and negro hire	619	14	8			
	for inward duties -	714	11	7			
	for outward duties - -	229	13	5	1630	10	0
	Paid for brokerage - -	821	13	6			
	for passport and certificate	68	19	7	890	13	1
				liv.	3246	10	6

Point-Petre, Gaudaloupe, Nov. 12, 1822.

Errors excepted, &c.

WILLIAM SUTTON.

Dr. *Mr. William Cummins, as owner of the ship Hiram, in account with William Sutton.* *Cr.*

1822. Oct. 12.											
hhd.			*lb.*	*liv.*	*lb.*	*liv.*	*s.*	*d.*	*liv.*	*s.*	*d.*
To 24	sugar, wt. nt.		35343	at 58	per 100,	20498	18	9			
7	do.	do.	9055	‘ 42	do.	3803	2	0			
12	do.	do.	19983	‘ 43	do.	8592	13	9			
43			64381						32894	14	6
				sol.	*d.*						
To 4856	lb. coffee,	at	22	6	per lb.	5463	0	0			
2019	do.		23		do.	2321	17	0			
6523	do.		23	6	do.	7664	10	6			
5247	do.		24		do.	6296	8	0			
18645	in 20 hhds. and 6 bbls.								21745	15	6
To 19	bales cotton, 4645 lb. at 140 liv. pr. 100,					6503	0	0			
To 2661	velts molasses, at 24 sols per velt,					3192	4	0			
									9696	4	0
To commission on 64336 liv. 6*s.* 4*d.* at 2½ per ct.									1608	8	4
To amount of disbursements, duties, &c. per acc’t annex’d,									3246	10	6
									69191	12	10
					Balance in cash on board,				960	3	2
								livres	70151	16	0

1822. Oct 10.	*liv.*	*s.*	*d.*
By neat proceeds of ship Hiram’s cargo, per account of sales annexed	68401	16	0
By cash bro’t out	1750	0	0
livres	70151	16	0

Point-Petre, Gaudaloupe,
Nov. 12, 1822.
Errors excepted.
WILLIAM SUTTON.

Dr. *Mr. John Johnson in account current with William Roberts.* *Cr.*

1822.		dols. cts.	1822.		dols. cts.
May 19.	To cash advanced per receipt - -	300	Oct. 28.	By ship Columbia, for hull thereof, complete, being 171¼ tons, at 16 dollars.	2744
June 5.	To sundries per bill - - -	458 12			
July 25.	To payment of his order to M B for	100			
29.	To 1 bag coffee, 96 lb. at 20 cents -	19 20			
Aug. 1.	To cash per receipt - - -	450			
—	To 5 hhds. rum, 555 gals. at 83⅓ cents	462 50			
—	To 3 boxes glass, 7 by 9, 10 dols. -	30			
Sept. 2.	To sundries per bill - - -	223 56			
—	To cash per receipt - - -	385			
20.	To 12 bls. flour, at 3 dls. 4 bls. pork at 12	144			
25.	To 1 hhd. sugar, 8 cwt. 2 qrs. 7 lb. nt. 10 dols.	85 62			
Oct. 29.	To cash and sundries in full - -	81			
		dols. 2744			dols. 2744

Salem, Oct. 28, 1822.
Errors excepted.
WILLIAM ROBERTS.

Dr. *Mr. James Richardson, in account current with Thomas Seccomb.* *Cr.*

1822.		dols.	cts.
June 12.	To sundries per bill - - - -	23	26
	To 53 bars Iron, wt. 21 2 10 for schooner William		
July 15.	To 121 do. - 31 2 18 do. do.		
26.	To 1 hhd. W. I. rum, ct. 107 gals. at 96 cts.	102	72
Aug. 28.	To cash per receipt - - - -	120	00
29.	To 4 bbls. flour, at 9 dols. 50 cts. -	38	00
Sept. 21.	To cash paid his order to James Wise	28	00
	To cash in full - - - - - -	2	52
	dols.	379	50

1822.		dols.	cts.
Oct. 12.	By schooner William for blacksmith's work per bill, viz. 6325 lb. at 6 cts.	379	50
	759 lb. tare at 12 —— per cent.		
	7084 lb. supplied —— per Dr.		
	dols.	379	50

NOTE. *When a person is furnished with his account current, it is necessary to specify the various charges, and when they are numerous, some accountants make but one charge of them, in the account current, referring to an annexed account of the several articles thus included.*

Salem, Oct. 12, 1822.
Errors excepted.
THOMAS SECCOMB.

Dr. *Mr. Thomas Gibson, in Interest*

	dls.	cts.				days.	dls.	cts.
To Int. on	35	00	fr. Jan. 31, '22	to	Oct. 12, '22,	256	1	47
To do. on	2962	00	Feb. 2,		do.	254	123	68
To do. on	2590	42	May 31,		do.	134	57	06
To do. on	1733	97	July 2,		do.	102	29	07
To do. on	73	63	July 12,		do.	92	1	11
To do. on	455	52	Aug. 25,		do.	47	3	51
To do. on	158	71	Sept. 30,		do.	12	0	31
						dols.	216	21

Dr. *Mr. William Mace, in Interest*

1821.		dls.	cts.		y.	m.	d.	dls.	cts.
March 3.	To Interest on	3869	20	for	1	5	11	335	97
April 26.	do. on	273	6	"	1	3	18	21	29
Aug. 18.	do. on	400		"		11	26	23	73
Dec. 28.	do. on	414	6	"		7	16	15	59
'22 Ja. 15.	do. on	200		"		7	9	7	30
Feb. 19.	do. on	300		"		5	25	8	75
Mar. 26.	do. on	1300		"		4	18	29	90
							dols.	442	53

Account with Thomas Merchant. *Cr.*

	dols.				*days.*	*dls.*	*cts.*
By Int. on	500	fr. Apr. 24, '22	to Oct. 12, '22,		171	14	5
By do	1133 25	' 25,	do. 12,		170	31	67
By do.	296 24	May 3,	do. 12,		162	7	88
By do.	215 '	' 5,	do. 12,		160	5	65
By do.	215 80	June 9,	do. 12,		125	4	43
By do.	109 74	' 24,	do. 12,		110	2	0
By do.	517 90	July 20,	do. 12,		84	7	15
Balance due on this ac't. carried to the debit of act.						143	48
				dols.		216	21

Salem, &c

Account with Thomas Merchant. *Cr.*

1822.		*dols.*	*cts.*				*dols.*	*cts.*
Jan. 16.	By interest on	339	67					
		427	81					
				y.	*m.*	*d.*		
		767	48	— 6		18.	25	32
Balance carried to account current						-	417	21
						dols.	442	53

Salem, September 26, 1822.

Errors excepted,

THOMAS MERCHANT.

BILL OF SALE.

TO all people to whom this present Bill of Sale shall come, I, R. P. of Salem, in the State of Massachusetts, merchant, send greeting. KNOW YE, That I, the said R. P. for and in consideration of the sum of *three thousand two hundred and twenty-two dollars*, to me in hand well and truly paid at or before the ensealing and delivery of these presents, by S. T. of the said Salem, merchant, the receipt whereof I do hereby acknowledge and am therewith fully and entirely satisfied and contented, have granted, bargained and sold, and by these presents do grant, bargain and sell, unto the said S. T. all the hull or body of the good brig Sally, together with all and singular her masts, spars, sails, rigging, cables, anchors, boats and appurtenances, now lying at Salem, and registered at the port of Salem, the certificate of whose registry is as follows:

In pursuance of an Act of the Congress of the United States of America, entitled, "AN ACT concerning the registering and recording of ships or vessels," R. P. of Salem, in the State of Massachusetts, merchant, having taken or subscribed the oath required by the said act, and having sworn he is the only owner of the ship or vessel called the Sally, of Salem, whereof William Knapp is at present master, and is a citizen of the United States, as he hath sworn, and that the said ship or vessel was built at Salisbury, in the said state, in the year eighteen hundred and twenty-one, as also appears by a certificate of enrolment, No. 129, issued in this district on the fourth day of August last, now surrendered—and N. S. surveyor of this district, having certified that the said ship or vessel has one deck and two masts, and that her length is sixty-nine feet five inches, her breadth twenty-two feet and one half inch, her depth eight feet two inches, and that she measures one hundred and six tons and forty ninety-fifths, that she is a square-sterned brig, has no galleries and no figure head, and the said R. P. having agreed to the description and admeasurement above specified, and sufficient security having been given according to the said act, the said brig has been duly registered at the port of Salem.

Given under my hand and seal at the port of Salem, this sixth day of September, in the year eighteen hundred and twenty two.

To have and to hold the said granted and bargained brig Sally and premises with the appurtenances unto the said S. T. his heirs, executors, administrators or assigns, to his only proper use, benefit and behoof forever. And I the said R. P. do avouch myself to be the true and lawful owner of the said brig and appurtenances, and have in myself full power, good right and lawful authority to dispose of the said brig as aforesaid, and her appurtenances in manner as aforesaid, and furthermore I the said R. P. do hereby covenant and agree to warrant and defend the said brig and premises, with the appurtenances against the lawful claims and demands of all persons whatsoever unto the said S. T. In witness whereof, I the said R. P. have hereunto set my hand and seal, this first day of September, in the year of our Lord one thousand eight hundred and twenty-two.

CHARTER-PARTY.

THIS Charter-party of affreightment, indented, made and fully concluded upon this ninth day of September, in the year of our Lord, one thousand eight hundred and twenty-two, between J. P. of Salem, in the county of Essex, and Commonwealth of Massachusetts, merchant, owner of the good ship Helen, of the burden of two hundred tons, or thereabouts, now lying in the harbour of Salem, whereof R. S. is at present master, on the one part, and C. D. of said Salem, merchant, on the other part, *Witnesseth*, That the said J. P. for the consideration hereafter mentioned, hath letten to freight the aforesaid ship, with the appurtenances to her belonging, for a voyage to be made by the said ship to London, where she is to be discharged (the danger of the seas excepted;) and the said J. P. doth by these presents covenant and agree with the said C. D. in manner following, *That is to say*, that the said ship in and during the voyage aforesaid, shall be tight, staunch and strong, and sufficiently tackled and apparelled with all things necessary for such a vessel and voyage, and that it shall and may be lawful for the said C. D. his agents or factors, as well at London as at Salem, to load and put on board the said ship, loading of such goods and merchandise as they shall think proper, contraband goods excepted.

IN consideration whereof, the said C. D. doth by these presents, agree with the said J. P. well and truly to pay, or cause to be paid unto him, in full for the freight or hire of said ship and appurtenances, the sum of three dollars per ton, per calendar month, and so in proportion for a less time, as the said ship shall be continued in the aforesaid service, in sixty days after her return to Salem. And the said C. D. doth agree to pay the charge of victualling and manning said ship, and all port charges and pilotage during said voyage, and to deliver the said ship, on her return to Salem, to the owner aforesaid or his order. And to the true and faithful of all and singular the covenants, payments and agreements aforementioned, each of the parties aforenamed binds and obliges himself, his executors and administrators, in the penal sum of two thousand dollars firmly by these presents. In witness whereof, the parties aforesaid have hereunto interchangeably set their hands and seals the day and year afore-written.

BILL OF LADING.

J. R.
1 *a* 53
Casks Potash,
ton. cwt.
8 18 *l s. d.*
at 80*s.*—35 12 0
Primage
5 *per cent.* 1 15 7
£.37 7 7

SHIPPED in good order and well conditioned by John Rolly, in and upon the good ship called the Iris, whereof is master for this present voyage Charles Ely, and now riding at anchor in the harbour of Salem, and bound for Liverpool, to say, *fifty-three casks of potash, containing eight tons and eighteen cwt.* being marked and numbered as in the margin, and are to be delivered in the like good order and well conditioned, at the aforesaid port of Liverpool (the danger of the seas excepted) unto Mr. J. May or to his assigns, they paying freight for the said goods, *four pounds* British sterling *per ton*, with five per cent. primage. In witness whereof the master or purser of the said ship hath affirmed to three bills of lading all of this tenor and date, the one of which being accomplished, the other two to stand void. Dated in Salem, Sept. 11th, 1822. C. ELY.

A NEW

INTRODUCTION

TO

BOOK-KEEPING,

AFTER THE

ITALIAN METHOD,

BY

DEBTOR AND CREDITOR:

IN WHICH THE THEORY OF THAT ART IS NOT ONLY ELUCIDATED, BUT THE PRACTICE MADE EASY AND FAMILIAR, BY THE ADDITION OF A

SET OF BOOKS,

EXHIBITING THE VARIOUS INCIDENTS WHICH USUALLY FALL IN A COURSE OF BUSINESS.

THE WHOLE LAID DOWN IN A MANNER SO EASY AND INTELLIGIBLE AS TO BE UNDERSTOOD IN A FEW DAYS.

WITH A

WASTE-BOOK

SUBJOINED AS AN EXAMPLE FOR PRACTICE.

AND ALL THE ACCOUNTS ARE REDUCED TO THE FEDERAL CURRENCY.

ON THE PLAN OF R. TURNER, LL. D.

.....

REVISED AND IMPROVED BY A MERCHANT.

.....

Deliver all things in NUMBER and WEIGHT, and put all in WRITING that thou GIVEST OUT or RECEIVEST IN. ECCLUS. xlii. 5.

SALEM:
PUBLISHED BY CUSHING & APPLETON.
T. C. Cushing, Printer.
1822.

SALES of the ship Hiram's Cargo, by William Sutton.

1821.		lb.	liv.		liv. sol. den.	liv. sol. den.
Sept. 24.	65 hds. fish, wt. nt.	72587	at 33 pr. 100.		23953 14 2.	
	6 do.	6515	32 do.		2084 16 0	
	2 do.	2126	31 do.		662 3 2	
	34 do.	36658	30 do.		10997 8 0	
	2 do. part. dam.	2184	sold at auc.		for 226 0 0	
	109					37924 1 4
		liv.	sol. den.			
	24 bbls beef, at	101	1 3 pr. bbl.		2425 10 0	
	7 do.	99	8 5 do.		695 18 11	
	29 do.	90	15 0 do.		2631 15 0	
	4 do.	83	0 0 do.		333 0 0	
	64					6085 3 11
			liv. sol.			
	13 bbls. pork -		136 0		1768 0 0	
	25 do. porter -		80 0		2000 0 0	
	3 box. lin. con. 169 piec.		96 0 per ps		16224 0 0	
	14 firk. butter, wt. 1129 lb.		2 5 per lb.		2540 5 0	
	5 thousand hoops -		240	per M.	1200 0 0	
	59 do. shingles		16	do.	944 0 0	
	35949 feet boards -		120	do.	1913 17 7	
	170 shaken hhds. -		8½	per hhd	1402 10 0	
						27992 12 7
		liv.	s. d.			72001 17 10
	Commission on 72001	17	10, at 5 per cent			3600 1 10
					liv.	68401 16 0

Errors excepted, &c.

Disbursements, Duties, &c. paid on ship Hiram, by Wm. Sutton.

1822.		liv.	s.	d.	liv.	s.	d.
Sept. 18.	Paid for a barrel of flour - -	86	10	0			
	to the admiralty - -	240	11	6			
	for fresh meat - - -	56	12	5			
	for flats to unload with -	341	13	6	725	7	5
	Paid to the harbour master -	66	10	4			
	for storage and negro hire	619	14	8			
	for inward duties -	714	11	7			
	for outward duties - -	229	13	5			
					1630	10	0
	Paid for brokerage - -	821	13	6			
	for passport and certificate	68	19	7			
					890	13	1
					liv.		

Point-Petre, Gaudaloupe, Nov. 12, 1822. liv. 3246 10 6

Errors excepted, &c.

WILLIAM SUTTON.

Dr. *Mr. William Cummins, as owner of the ship Hiram, in account with William Sutton.* *Cr.*

1822. Oct. 12.											1822. Oct 10.	liv.	s.	d.		
	hhd.			lb.	liv.	lb.	liv.	s.	d.	liv.	s.	d.				
To 24 sugar,	wt. nt.	35343	at 58	per 100,	20498	18	9				By neat proceeds of ship Hiram's cargo, per account of sales annexed	68401	16	0		
7	do.	do.	9055	‘ 42	do.	3803	2	0								
12	do.	do.	19983	‘ 43	do.	8592	13	9								
43			64381						32894	14	6					
			sol.	d.							By cash bro't out	1750	0	0		
To 4856 lb. coffee, at			22	6	per lb.	5463	0	0								
2019	do.		23		do.	2321	17	0								
6523	do.		23	6	do.	7664	10	6								
5247	do.		24		do.	6296	8	0								
18645 in 20 hhds. and 6 bbls.									21745	15	6					
To 19 bales cotton, 4645 lb. at 140 liv. pr. 100,						6503	0	0								
To 2661 velts molasses, at 24 sols per velt,						3192	4	0								
									9696	4	0					
To commission on 64336 liv. 6*s.* 4*d.* at 2½ per ct.									1608	8	4					
To amount of disbursements, duties, &c. per acc't annex'd,									3246	10	6	livres 70151	16	0		
									69191	12	10					
Balance in cash on board,									960	3	2					
								livres	70151	16	0					

Point-Petre, Gaudaloupe,
Nov. 12, 1822.
Errors excepted.
WILLIAM SUTTON.

Dr. *Mr. John Johnson in account current with William Roberts.* *Cr.*

1822.		dols.	cts.	1822.		dols.	cts.
May 19.	To cash advanced per receipt	300		Oct. 28.	By ship Columbia, for hull thereof, complete, being 171½ tons, at 16 dollars.	2744	
June 5.	To sundries per bill	458	12				
July 25.	To payment of his order to M B for	100					
29.	To 1 bag coffee, 96 lb. at 20 cents	19	20				
Aug. 1.	To cash per receipt	450					
—	To 5 hhds. rum, 555 gals. at 83⅓ cents	462	50				
—	To 3 boxes glass, 7 by 9, 10 dols.	30					
Sept. 2.	To sundries per bill	223	56				
—	To cash per receipt	385					
20.	To 12 bls. flour, at 8 dls. 4 bls. pork at 12	144					
25.	To 1 hhd. sugar, 8 cwt. 2 qrs. 7 lb. nt. 19 dols.	85	62				
Oct. 29.	To cash and sundries in full	81					
		dols. 2744				dols. 2744	

Salem, *Oct.* 28, 1822.
Errors excepted.
WILLIAM ROBERTS.

Dr. *Mr. James Richardson, in account current with Thomas Seccomb.* *Cr.*

1822.		dols.	cts.	1822.		dols.	cts.
June 12.	To sundries per bill - - - -	23	26	Oct. 12.	By schooner William for blacksmith's work per bill, viz. 6325 lb. at 6 cts. 759 lb. tare at 12 —— per cent. 7084 lb. supplied —— per Dr.	379	50
	To 53 bars Iron, wt. 21 2 10 for schooner William						
July 15.	To 121 do. - 31 2 18 do. do.						
26.	To 1 hhd. W. I. rum, ct. 107 gals. at 96 cts.	102	72				
Aug. 28.	To cash per receipt - - - -	180	00				
29.	To 4 bbls. flour, at 9 dols. 50 cts. -	38	00				
Sept. 21.	To cash paid his order to James Wise	28	00				
	To cash in full - - - - - -	2	52				
	dols.	379	50		dols.	379	50

NOTE. *When a person is furnished with his account current, it is necessary to specify the various charges, and when they are numerous, some accountants make but one charge of them, in the account current, referring to an annexed account of the several articles thus included.*

Salem, Oct. 12, 1822.
Errors excepted.
THOMAS SECCOMB.

On Bills.

First. When you draw a bill payable at any time on a person that owes you money, the person on whom the bill is drawn is creditor, and accompt of bills receivable is debtor. When the bill is paid, accompt of bills receivable is creditor, and cash, or the person to whom the bill is paid, is debtor.

Secondly. When a person draws a bill on you, payable at a certain time, the person that draws the bill is debtor, and accompt of bills payable is creditor. When you pay the bill, cash is creditor, and accompt of bills payable is debtor.

Thirdly. When a person indebted to you draws a bill on a third person to pay you so much, and the bill is accepted, the person that draws the bill, or the accompt on which the money is due, is creditor, and accompt of bills receivable is debtor. When you receive the bill, then accompt of bills receivable is creditor, and cash debtor.

On accidental Losses, Profits, and other Expenses.

First. What money you gain, win or receive gratis, cash is debtor to profit and loss, and profit and loss creditor by its value.

Secondly. What money or commodity you give away, lose, or is spoiled, &c. is creditor, and profit and loss is debtor for its value.

On Foreign Trade.

First. When goods are sent to your factor abroad, make the voyage debtor, and the goods creditor.

Secondly. When you have advice that your factor has received the goods, then he becomes debtor to the voyage, and the voyage creditor.—If he gains by selling the goods, he becomes debtor to profit and loss on account of the gain.

Thirdly. If he returns the goods, he is creditor, and the goods are debtor.

On Household Expenses.

What money or commodity you make use of, or is spent in your family, &c. is creditor, and profit and loss is debtor, for its value.

NOTE. You may erect an account of household expenses, and make it debtor, instead of profit and loss.

NOTE ALSO, That you never meddle with the account of cash, but when money is either received or paid.

On Errors.

If you have entered any thing in your Ledger under a wrong title, or any otherwise false, you must not blot it out, but make this mark (*X*) in the margin against it; and write on the contrary side, *Error per contra*, with the sum against it, with the same mark in the margin; so will the accompt be right without blotting, as if you had made no such error at all.

To remove an Accompt from one Folio to another.

When in your Ledger any accompt comes to the foot of the page, and there is not room to finish it, balance or close up the accompt in that place thus: add up the debtor and creditor sides, and subtract the lesser from the greater, and make the less debtor to, or creditor by, itself, for the difference carried to such a page; so will the account be balanced. Then turn to a new pair of pages in the Ledger, and put the title of the accompt as before, and make it debtor to, or creditor by, itself, referring to the folio of the old accompt.

To balance the Ledger.

When every transaction is entered into the Ledger out of the Journal, the next thing is to balance your Ledger, that is, to make it even throughout the whole book. To this end you must erect a new accompt at the end, by the title of *Balance debtor, per Contra creditor*. To the debtor of this accompt will be brought all the money, goods and debts be-

longing or remaining due to you; and on the creditor will appear all the debts you owe. By this, and the accompt of profit and loss, will all the other accompts be evened, in the following manner.

To balance your Cash.

First. Add up the debtor and creditor side of the first accompt which is cash, and subtract the one from the other; make Balance debtor to Cash for the money remaining in your hands, and Cash creditor by Balance for the same sum, which will make both sides of the accompt even.

Secondly. For balancing goods, observe, 1st, When none are sold, the account is evened by making Balance creditor for the whole remaining, at the first cost. 2d, When all are sold, then the account is balanced by charging it debtor to profit and loss for the gain, or creditor for the loss. 3d, When only part are sold, first make the accompt creditor by balance for what remains, at prime cost, and balance debtor, and charge the goods debtor to, or creditor by, profit and loss for the money gained or lost on what are sold.

Thirdly. For balancing the accompts of men, observe, 1st, When the debtor side is heaviest, i. e. when they owe you any thing, then make their accompt creditor by balance, and balance debtor for the sum remaining. 2d, When the creditor is heaviest, i. e. when you owe them, then charge their accompt debtor to balance, and balance creditor by the difference. 3d, When both sides are even, then you are only to add the debtor and creditor sides together, and set down the same sum, and it is done.

The last accompt save two to be balanced is profit and loss. Add up the debtor by itself, and the creditor by itself, and deduct the lesser sum out of the greater, and note the difference; then, if the debtor be more than the creditor, make stock debtor for so much lost; but if the creditor be more than the debtor, make stock creditor for so much gained.

The last accompt to be balanced is balance itself. Add up severally the debtor and creditor side, and make the creditor side equal to the debtor, by making balance creditor by

stock, and stock debtor: then add up the debtor and creditor sides of the stock, and, if the sums are equal, your accompt is rightly stated; otherwise it is wrong, and you must search till you find out the error.

Of opening a new Set of Books.

The manner in which a new inventory is to be formed from the said balance, in order for opening new books, is thus:—Make the particulars on the debtor side of balance, being the several branches of your estate, severally debtors to stock, and stock creditor: and make the particulars on the creditor side of balance, being the several debts you owe, severally creditors by stock, and stock debtor.

☞ It is customary with merchants to distinguish their books by the letters of the alphabet: the first set they mark with A, the second with B, the third C, and so on.

THE

WASTE-BOOK.

☞When you post any accompt out of a Waste-Book into the Journal, you must write J. against it, in the margin, to show that *that account is Journalized.*

	Boston, January 1st, 1819.	$.	c.
	An Inventory of the Money, Wares, and Debts, belonging to me, A. B.		
		dls. cts.	
	I have in ready money - - -	1000,00	
	10 bags of hops, at 10 dols. per bag	100,00	
J	4 pipes of wine, at 65½ dols. per pipe - - - - - - - - -	262,00	
	6 pieces of broadcloth, at 90 dols. 10 cts. per piece - - - -	540,60	
	Thomas Richards owes me, on demand - - - - - - - - -	45,75	
			1948 35
	"		
	I am Indebted,		
		d. c.	
J	To John Forrest on bond - - -	50,00	
J	To Samuel Taylor on account - -	10,00	
			60 00
J	Bought of John Jones ½ ton of Cheshire cheese, at 65,50 per ton, for which I paid cash - - - - - - - - - - - -		32 75
	3d.		
	Bought of Richard Payton 4 hogsheads of cider, at 10,75 per hhd.		
J	Paid in cash - - - - - - - -	25,50	
	Remains due at 1 month - - - -	17,50	
			43 00

Boston, January 5th, 1819.

		$.	C.
J	Bought of Samuel Taylor 2 hogsheads of tobacco, at 39,60 per hhd.—to pay in 3 months	79	20
	7th		
J	Sold to John Williams 4 bags of hops, for cash, at 15,75 per bag	63	00
	10th		
J	Sold to Samuel Taylor 2 pipes of wine, at 80,33 per pipe: Received in cash 50,75 Remains due on demand 109,91	160	66
	15th		
J	Sold John Jones 1 piece of Broadcloth, to be paid in 1 month	97	15
	19th		
J	Bartered 4 hhds. of cider, at 10,00 per hhd. for ½ ton of Gloucester cheese, at the same value	40	00
	22d		
J	Lent Andrew Thompson, to be paid on demand	20	00
	26th		
J	Drawn a bill on Thomas Richards, to be paid at sight	20	00

	Boston, January 28th, 1819.	$.	C.
J	Thomas Richards paid the bill which I drew on him - - - - - - -	20	00
	29th		
J	John Forrest has drawn a bill on me, payable at sight - - - - - -	40	00
	February 5th		
J	Paid the bill John Forrest drew on me	40	00
	8th		
J	Borrowed of James Morgan the sum of 40 dollars - - - - - -	40	00
	9th		
J	Paid John Forrest a quarter's interest, due December last - - - -	0	75
	10th		
J	This day dined with the Hon. A B, Esq. and gave his servants - - - -	0	80
	11th		
J	Won at billiards this day - - -	7	37½
	13th		
J	Paid household expenses, last month	15	67
	15th		
J	Paid my book-keeper one quarter's salary, and other expenses - - -	50	75

	Boston, February 16th, 1819.	$.	C.
W.C.	Shipped in the America, John Lane, master, consigned to William Cowley, merchant, New-York, marked as in the margin,		
J	2 cwt. of Cheshire cheese, value 8,75½		
	Paid freight and custom - - 2,33½		
		11	09
	20th		
J	Received advice that William Cowley has received the cheese safe at New-York:		
	Sold for - - - - - 21,07½		
	Charges deducted - - - 2,75		
		18	32½
	23d		
J	Received from my factor, William Cowley, at New-York, 1 chest of sugar:		
	Neat weight 3 cwt. 2 q. value - 15,87½		
	Paid freight and custom here - 2,45		
		18	32½
	25th		
J	Received a legacy left me by my uncle	20	00
	27th		
J	Paid for supporting the poor - -	0	87½

End of the Waste-Book.

THE

JOURNAL.

The figures in the first column of the margin refer to the folios of the Ledger where the *debtor-accompt* is found; those in the second column, the *creditor-accompt*.

Boston, January 1st, 1819.

			$.	C.
		Sundry Accounts Dr. to Stock,		
1		Cash, in ready money - - - - - -	1000	00
2		Hops, for 10 bags at 10,00 per bag - -	100	00
2		Wine, for 4 pipes at 65,50 per pipe - -	262	00
2		Broadcloth, for 6 pieces at 90,10 per piece	540	60
3		Thomas Richard, for note on demand -	45	75
	1		1948	35
		"		
1		Stock Dr. to Sundry Accounts,		
	3	To John Forrest, on bond - - - - -	50	00
	3	To Samuel Taylor, on account - - -	10	00
			60	00
		"		
4		Cheese Dr. to Cash,		
	1	For half a ton of Cheshire - - - - -	32	75
		3d.		
4		Cider Dr. to Sundry Accounts,		
	1	To Cash, paid in part for 4 hhds. at 10,75 per hhd. - - - - - - 25,50		
	4	To Richard Payton, remains due at 1 month - - - - - - - - - 17,50		
			43	00
		5th		
5		Tobacco Dr. to Samuel Taylor,		
	3	For 2 hhds. to pay in 3 months, at 39,60 per hhd. - - - - - - - - - -	79	20

Boston, January 7th, 1819.

			$.	C.
1		Cash Dr. to Hops,		
	2	Received for 4 bags, at 15,75 per bag -	63	00
		10th		
		Sundry Accounts Dr. to Wine,		
1		Cash, received in part for 2 pipes - 50,75		
3		Samuel Taylor, on demand, for - 109,91		
	2		160	66
		15th		
5		John Jones Dr to Broadcloth,		
	2	For 1 piece, to be paid in one month -	97	15
		19th		
4		Cheese Dr. to Cider,		
	4	For 4 hhds. received in barter for ½ a ton of Gloucester of the same value - -	40	00
		22d		
6		Andrew Thompson Dr to Cash,		
	1	To be paid on demand - - - - - -	20	00
		26th		
6		Bills Receivable Dr. to Thomas Richards,		
	3	For one drawn on him to be paid at sight	20	00
		28th		
1		Cash Dr. to Bills Receivable,		
	6	Received the bill of Thomas Richards -	20	00

		Boston, January 29th, 1819.	$.	C.
3		John Forrest Dr. to Bills Payable,		
	6	For one to be paid by me at sight - -	40	00
		February 5th		
6		Bills Payable Dr. to Cash,		
	1	Paid John Forrest the bill - - - - -	40	00
		8th		
1		Cash Dr. to James Morgan,		
	7	Borrowed of him - - - - - - - -	40	00
		9th		
7		Profit and Loss Dr. to Cash,		
	1	Paid John Forrest 1 quarter's interest -	0	75
		10th		
7		Profit and Loss Dr. to Cash,		
	1	Given to A B, Esq's servants - - - -	0	80
		11th		
1		Cash Dr. to Profit and Loss,		
	7	Won at billiards - - - - - - - -	7	37½
		13th		
7		Profit and Loss Dr. to Cash,		
	1	For 1 month's household expenses - -	15	67
		15th		
7		Profit and Loss Dr. to Cash,		
	1	For a quarter's salary to my book-keeper, and other expenses - - - - - -	50	75

Boston, February 16th, 1819.

			$.	C.
8		Voyage to New-York Dr. to Sundry Accounts,		
	4	To Cheese, for 2 cwt. - - - - -	8,75½	
	1	To Cash paid freight and custom -	2,33½	
			11	09
		20th		
8		William Cowley Dr. to Sundry Accounts,		
	8	To Voyage to New-York - - - -	11,99	
	7	To Profit and Loss gained by selling Cheese - - - - - - - - -	7,23½	
			18	32½
		23d.		
8		Sugar Dr. to Sundry Accounts,		
	8	To William Cowley, for 1 chest neat weight 3 cwt. 2 quarters - - -	15,87½	
	1	To Cash paid freight and custom -	2,45	
			18	32½
		25th		
1		Cash Dr. to Profit and Loss,		
	7	For a legacy left me by my uncle - -	20	00
		27th		
7		Profit and Loss Dr. to Cash,		
	1	Paid for supporting the poor - - - -	0	87½

End of the Journal.

THE

LEDGER.

☞Every entry in the Ledger must be written double; the debtor or accompt charged, the creditor or accompt discharged: so that every debtor must have its correspondent creditor, and every creditor must have its debtor, and each of them answering exactly the other.

The column placed before those for *dolls. cts.* on the debtor side is marked *Cr.* and refers to the folio where the same accompt has credit; that on the creditor side, marked *Dr.* refers in like manner to the folio where the same is made debtor.

It may not be improper to advise the book-keeper, when posting up his accompts in the ledger, always in the first place to post up his debit, then give the proper credit of that entry; for if, through haste or some interruption, a mistake arises on the Cr. side, it is not of such bad consequence as when it happens on the Dr. side; for the one may be a total loss, when the other is but an error in accompt.

Let the Waste be examined before Journalizing, and the Journal before posting.

Journalize and post in the exact order in which the entries occur.

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1819	Stock Dr.	Cr	$.	C.
Jan. 1	To sundry accounts as per Journal,			
	To John Forrest, on bond - - -	3	50	00
	To Samuel Taylor, on account -	3	10	00
	To balance for the neat of my estate	9	1913	03
			1973	03

Cash Dr.

Jan. 1	To stock, in ready money - - -	1	1000	00
7	To hops, received for 4 bags - -	2	63	00
10	To wine, received in part for 2 pipes	2	50	75
28	To bills receivable, received of Thomas Richards - - - - -	6	80	00
Feb. 8	To James Morgan, borrowed of him	7	40	00
11	To profit and loss, won at billiards	7	7	37½
25	To profit and loss for a legacy left me by my uncle - - - - -	7	20	00
			1201	12½

1819	Contra Cr.	Dr	$.	C.
Jan. 1	By sundry accounts, as per Journal,			
	By cash, in ready money - - -	1	1000	00
	By hops, 10 bags, at 10,00 per bag	2	100	00
	By wine, 4 pipes, at 65,50 per pipe	2	262	00
	By broadcloth, 6 pieces, at 90,10 per piece - - - - - - - - -	2	540	60
	By Thomas Richards, per note on demand - - - - - - - -	3	45	75
	By profit and loss, gained in trade	7	24	68
			1973	03

	Contra Cr.			
Jan. 1	By cheese, paid for half a ton -	4	32	75
3	By cider, paid in part for 4 hhds.	4	25	50
22	By Andrew Thompson, lent him	6	20	00
Feb. 5	By bills payable, paid John Forrest	6	40	00
9	By profit and loss, paid a quarter's interest - - - - - - - -	7	0	75
10	By profit and loss, given A B, Esq's servants - - - - - - - -	7	0	80
13	By profit and loss paid household expenses - - - - - - - -	7	15	67
15	By profit and loss, paid my book-keeper a quarter's salary, and other expenses - - - - - -	7	50	75
16	By voyage to New-York, paid freight and custom - - - - - -	8	2	33½
23	By sugar, paid do. - - - - -	8	2	45
27	By profit and loss, paid for supporting the poor - - - - - -	7	0	87½
	Balance, remains in my hands -	9	1009	24½
			1201	12½

1819	Hops Dr.	Cr	$.	C.
Jan. 1	To stock, 10 bags, at 10,00 per bag	1	100	00
	To profit and loss gained - - -	7	23	00
			123	00

	Wine Dr.			
Jan. 1	To stock, 4 pipes, at 65,50 per pipe	1	262	00
	To profit and loss, gained - - -	7	29	66
			291	66

	Broadcloth Dr.			
Jan. 1	To stock, 6 pieces, at 90,10 per piece - - - - - - - - -	1	540	60
	To profit and loss, gained - - -	7	7	05
			547	65

1819	Contra Cr.	Dr.	$.	C.
Jan. 7	By cash, received for 4 bags, at 15,75 per bag - - - - - - -	1	63	00
	By balance, remain 6 bags, at 10,00 per bag - - - - - - - - -	9	60	00
			123	00

Contra Cr.

Jan. 10	By sundry accounts, as per Journal,			
	By cash, received in part for 2 pipes	1	50	75
	By Samuel Taylor, remains due -	3	109	91
	By balance, remain 2 pipes - -	9	131	00
			291	66

Contra Cr.

Jan. 15	By John Jones, to pay in 1 month	5	97	15
	By balance, remain 5 pieces, at 90,10 per piece - - - - - -	9	450	50
			547	65

1819	Thomas Richards Dr.	Cr	$.	C.
Jan. 1	To stock per note on demand -	1	45	75
			45	75

John Forrest Dr.

Jan. 29	To bills payable, for one drawn on me, to pay at sight - - - - -	6	40	00
	To balance, remains due to him -	9	10	00
			50	00

Samuel Taylor Dr.

Jan. 10	To wine, due on demand - - -	2	109	91
			109	91

1819	Contra Cr.	Dr	$.	C.
Jan. 26	By bills receivable, for one drawn on him, to be paid at sight - - -	6	20	00
	By balance, remains due on demand	9	25	25
			45	75

	Contra Cr.			
Jan. 1	By stock, due on bond - - - - -	1	50	00
			50	00

	Contra Cr.			
Jan. 1	By stock, due on account - - -	1	10	00
	By tobacco, for 2 hhds. - - -	5	79	20
	By balance, due me - - - - -	9	20	71
			109	91

1819	Cheese Dr.,	Cr	$.	C.
Jan. 1	To cash, paid for half a ton of Cheshire	1	32	75
	To cider, bartered 4 hogsheads, at 10,00 per hhd. for half a ton of Gloucester	4	40	00
	To profit and loss, gained	7	2	20½
			74	95½

	Cider Dr.			
Jan. 3	To cash, paid in part for 4 hhds.	1	25	50
	To Richard Payton, remains due	4	17	50
			43	00

	Richard Payton Dr.			
Jan. 3	To balance, remains due to him	9	17	50

1819	Contra Cr.	D.	$.	C.
Feb. 16	By voyage to New-York, for 2 cwt. of Cheshire	8	8	75½
	By balance, remains half a ton Gloucester	9	40	00
	By balance, remains 8 cwt. of Cheshire	9	26	20
			74	95½

Contra Cr.

Feb. 19	By cheese, half a ton of Gloucester received in barter for 4 hhds. at 10,00 per hhd.	4	40	00
	By profit and loss, lost	7	3	00
			43	00

Contra Cr.

Jan. 3	By cider remains due at one month	4	17	50

1819	Tobacco Dr.	Cr	$.	C.
Jan. 5	To Samuel Taylor, for 2 hhds. to be paid in 3 months - - - - - -	3	79	20

	John Jones Dr.			
Jan. 15	To broadcloth, for 1 piece, to pay in one month - - - - - - -	2	97	15

NOTE. The Debtor side of all accompts of *goods*, shows what they *cost*; the Creditor side, what *returns* they have made.

NOTE ALSO, That the Debtor side of all accompts of *men*, is the *charge*, or what they stand indebted to you; and the Creditor is the *discharge*.

1819	Contra Cr.	Dr	$.	C.
	By Balance, remains 2 hhds. - -	9	79	20

	Contra Cr.			
	By Balance, remains due to me -	9	97	15

NOTE. When the Debtor side of accompts belonging to men exceeds, then the balance is due to *me*; but if the Creditor side is most, the balance is due to *him*.

1819	Andrew Thompson Dr.	Cr	$.	C.
Jan. 22	To Cash, lent him - - - - - -	1	20	00

Bills Receivable Dr.

Jan. 26	To Thomas Richards, for one drawn on him, to be paid at sight - -	2	20	00

Bills Payable Dr.

Feb. 5	To Cash, paid John Forrest his bill drawn on me payable at sight -	1	40	00

1819	Contra Cr.	Dr	$.	¢.
	By Balance, remains due to me -	9	20	00

	Contra Cr.			
Jan. 28	By Cash, received the bill - -	1	20	00

	Contra Cr.			
Jan. 2	By John Forrest, for a bill drawn on me - - - - - - - - - -	3	40	00

1819	Profit and Loss Dr.	Dr	$	C.
Feb. 9	To Cash, paid John Forrest a quarter's interest - - - - - - -	1	0	75
10	To Cash, given A B Esq's servants	1	0	80
13	To Cash, paid 1 month's household expenses - - - - - - - -	1	15	67
15	To Cash, paid my book-keeper one quarter's salary, and other expenses - - - - - - - - -	1	50	75
27	To Cash, pd. for supporting the poor	1	0	87½
	To Cider, lost - - - - - - -	4	3	00
	To Stock, gained by trade - -	1	24	68
			96	52½

	James Morgan Dr.			
	To Balance, remains due on demand	9	40	00

1819	Contra Cr.	Pr.	$.	C.
Feb. 11	By Cash, won at billiards - - -		7	37½
20	By William Cowley, gained by selling my goods at New-York -	8	7	23½
25	By Cash, for a legacy left me by my uncle - - - - - - - - -	1	20	00
	By Hops, gained - - - - - - -	2	23	00
	By Wine, gained - - - - - -	2	29	66
	By Broadcloth, gained - - - -	2	7	05
	By Cheese, gained - - - - -	4	2	20½
			96	52½

	Contra Cr.			
Feb. 8	By Cash, borrowed - - - - -	1	40	00

1819	Voyage to New-York Dr. -	Cr	$.	C.
Feb. 16	To Sundry Accounts, as per Journal,			
	To Cheese, for 2 cwt. of Cheshire	4	8	75½
	To Cash, paid freight and custom	1	2	33½
			11	09

William Cowley Dr.

Feb. 20	To Sundry Accounts, as per Journal,			
	To voyage to New-York - - -	8	11	09
	To Profit and Loss, gained by selling goods - - - - - - -	7	7	23½
			18	32½

Sugar Dr.

Feb. 23	To Sundry Accounts, as pr. Journal,			
	To William Cowley, for one chest, neat weight 3 cwt. 2 qrs, valued at	8	15	87½
	To Cash, paid freight and custom	1	2	45
			18	32½

1819	Contra Cr.	Dr	$.	C.
Feb. 20	By William Cowley, who has received the goods sent thither - -	8	11	09

Contra Cr.

Feb. 23	By Sugar, received 1 chest, neat wt. 3 cwt. 2 qrs. valued at - - -	8	15	87½
	By Balance, remains due to me -	9	2	45
			18	32½

Contra Cr.

	By balance, remains 1 chest, neat wt. 3 cwt. 2 qrs. valued with charges at	9	18	32½

1819	Balance Dr.	Cr	$.	C.
	To Cash, remaining in my hands -	1	1009	24½
	To Hops, 6 bags remain, at 10,00 per bag - - - - - - - - -	2	60	00
	To Wine, remain 2 pipes, at 65,50 per pipe - - - - - - - -	2	131	00
	To Broadcloth, remain 5 pieces, at 90,10 per piece - - - - -	2	450	50
	To Thomas Richards, remains due on demand - - - - - - - -	3	25	75
	To Cheese, remains ½ a ton of Gloucester, at 80,00 per ton 40,00	4		
	" ¼ " 8 cwt. of Cheshire, at 65,50 per ton 26,20	4		
			66	20
	To Tobacco, remains 2 hds. at 39,60 per hhd. - - - - - - - -	5	79	20
	To John Jones, remains due to me	5	97	15
	To Andrew Thompson, remains due to me - - - - - - - - -	6	20	00
	To William Cowley, remains due to me - - - - - - - - -	8	2	45
	To Samuel Taylor, remains due to me - - - - - - - - - -	3	20	71
	To sugar, remains in my hands -	8	18	32½
			1980	53

These articles on the Debtor side are the several branches of my present estate.

1819	Contra Cr.	Cr.	£.	C.
	By John Forrest, remains due to him	3	10	00
	By Richard Payton, remains due to him	4	17	50
	By James Morgan, remains due to him	7	40	00
	By Stock, for the neat of my estate	1	1913	03
			1980	53

These articles on the Creditor side (except the last, which is the neat value of my estate) are the several debts I owe.

End of the Ledger.

LIST OF AUXILIARY BOOKS,

MORE OR LESS NECESSARY TO DIFFERENT KINDS OF BUSINESS, AND TO BE MODIFIED ACCORDINGLY.

CASH BOOK, (Ledger-wise) in which receipts of money are entered on the left, and payments on the right hand page.

INVOICE BOOK, of all shipments out and home.

LETTER BOOK, containing copies of letters sent and received.

BILL BOOK, of exchange and acceptances.

House-Expense Book.

Charges-on-Merchandise Book.

Till Book, in which *Retailers* enter their daily cash sales.

A

WASTE-BOOK

AS AN

EXAMPLE FOR PRACTICE.

Boston, March 1st, 1819.	$.	C.
An Inventory of the Money, Wares, and Debts, belonging to me, A. B. taken this day, as follows, viz.		
	dols. cts.	
I have, in money - - - - - -	1009,24½	
6 bags of hops, at 10,00 per bag -	60,00	
2 pipes of wine, at 65,50 per pipe	131,00	
5 pieces of broadcloth, at 90,10 per piece - - - - - - - -	450,50	
Thomas Richards owes me, on demand - - - - - - - - -	25,75	
10 cwt. of Gloucester cheese, at 4,00 - - - - - - - - -	40,00	
8 cwt. of Cheshire do. at 3,37½ -	26,20	
2 hogsheads of tobacco, at 39,60 -	79,20	
John Jones owes me - - - - -	97,15	
Andrew Thompson owes me - -	20,00	
William Cowley owes me - - -	2,45	
1 chest of sugar, weighing 3 cwt. 2 qrs. value - - - - - - -	18,32½	
Samuel Taylor owes me - - -	20,71	
		1980 [illegible]
I am Indebted,		
	d c.	
To John Forrest - - - - - -	10,00	
To Richard Payton - - - - -	17,50	
To James Morgan - - - - - -	40,00	
		67 [illegible]

Boston, March 3d, 1819.	$.	c.
Bought of James Burrows 20 quintals of cod-fish, at 3,00 per quintal		
Paid cash 50,00		
Rest due on demand 10,00		
	60	00
5th		
Sold to John Fenton 1 pipe of wine, due at 10 days	70	00
7th		
Bought of William Lamson 3 bales of India cottons, containing 80 pieces each—240 pieces, at 2,25 per piece		
Paid Cash 200,00		
Gave my note for the rest on demand 340,00		
	540	00
10th		
Sold to John Diman 3 pieces of broadcloth, at 100,00 per piece, for which I received cash	300	00
12th		
Shipped 3 bales of India cottons, containing 240 pieces, on board the schooner Bee, James Sands master, bound to Baltimore, consigned to John Flint, merchant there, marked as in the margin.		
J. F. No. 1, 2 & 3		
240 pieces, valued at 2,50 per peice 600,00		
Paid freight and charges 10,40		
	610	40

Boston, March 15th, 1819.	$	c.
Bought of Henry Gerry 10 pipes of brandy, at 120,00 per pipe - - - - - - -		
Paid in cash - - - - - - - - 150,00		
Gave a bill on John Jones for - - 97,15		
Due at 3 months - - - - - - - 952,85		
	1200	00
20th		
Borrowed of John Jackson, for 3 months, at 5 per cent. - - - - - - - - -	400	00
24th		
Paid James Burrows in full for fish - -	10	00
27th		
Bartered with James Dobson,		
6 cwt. of Gloucester cheese, at 5,00 per cwt. - - - - - - - - - 30,00		
2 hhds. of tobacco, at 42,00 per hhd. 84,00		
	114	00
For 6 barrels of cider, at 3,00 per barrel - - - - - - - - - 18,00		
14 do. of strong beer, at 7,00 - - 98,00		
	116	00
30th		
Received in full for wine, of John Fenton	70	00
"		
John Jones is deceased, and has left me a legacy, payable by his executor, John Palmer. - - - - - - - - - - -	200	00

Boston, April 3d, 1819.	$.	C.
Thomas Richards has failed, and I have compounded my debt of 25,75 with him.		
Composition received is - - - - 14,50		
Discount is - - - - - - - - - 11,25		
	25	75
6th		
Paid a quarter's house-rent, due April 1st.	25	00
9th		
Sold Edward Nelson 20 quintals of cod fish, at 3,50 per quintal.		
Received in cash - - - - - - 15,25		
His bill on John Burrows - - - 54,75		
	70	00
15th		
Bought for cash 20 pieces of nankeens at 1,00 per piece - - - - - - 20,00		
5 pieces of moreens, at 7,00 - - - 35,00		
	55	00
20th		
Received from on board the Friendship, Isaac Watson master, from Hamburgh, shipped by my order, by Herman Van Beck, merchant there,		
60 pieces of Russia Sheeting, at 14,00 per piece - - - - - - - - - 840,00		
20 do. Platillas, at 7,00 per piece - 140,00		
30 pair of silk hose, at 1,25 per pair 37,50		
Amount carried forward, 1017,50		

Boston, April 20th, 1819.		$	c.
Amount brought forward - - -	1017,50		
Charges at shipping, per invoice -	10,00		
Freight, custom and other charges here - - - - - - - - - -	100,50		
		1128	00
24th			
Received of John Burrows, in full for Edward Nelson's bill - - - - - - -		54	75
26th			
Sold for cash 10 pieces of nankeen, at 1,25 per piece - - - - - - - - - -		12	50
26th			
Bought of John Burrows 40 barrels of flour, at 10,00 per barrel.			
Paid in cash - - - - - - - -	100,00		
Gave a bill on John Palmer - -	150,00		
Due at 3 months - - - - - -	150,00		
		400	00
28th			
Sent as an adventure to the Havana, per ship Recovery, Joseph Rollin master, consigned to said Rollin for sales and returns, the goods following, viz.			
20 bbls. of flour, at 10,00 per bbl.	200,00		
30 pieces Russia sheeting, at 16,00 per piece - - - - - - - -	480,00		
10 do. nankeen, at 1,25 - - - -	12,50		
Charges at shipping - - - - -	45,50		
		738	00

Boston, April 30th, 1819.	$.	C.
Bought of James Knight 50 pieces of Irish linens, 25 yards each, 8,50 per piece.		
Paid in cash - - - - - - - 44,00		
Due at 90 days - - - - - - - 381,00		
	425	00
"		
Sold for cash 5 barrels of flour, at 12,00 per barrel - - - - - - - - - - - -	60	00
May 1st		
Charges on my trade last month - - -	40	00
3d		
Received from on board the Polly, James Smith master, from Baltimore, shipped by John Flint on my account,		
75 barrels of flour, at 7,50 per barrel as per invoice - - - - - - - - 562,50		
20 bush. of corn, at 50 cts. per bush. 10,00		
Received in cash - - - - - 185,30		
Paid freight - - - - - - - 75,00		
	832	80
The above is the neat proceeds of my 3 bales of India Cottons, as per John Flint's account of sales.		
5th		
Sold for cash 3 barrels of cider, at 5,50 per barrel - - - - - - - - - - -	16	50

Boston, May 6th, 1819.	$.	C.
Bought of William Lamson 4 bbls. of strong beer, at 8,00 per barrel - - - - - -	32	00
Paid him in cash - - - - - - - - - -	75	00
8th		
Sold for cash 10 barrels of flour, at 12,00 per barrel - - - - - - - - - -	120	00
9th		
Gave in charity - - - - - - - - -	5	00
10th		
Accepted William Lamson's bill on me, payable at 3 days' sight, for - - - - - -	150	00
11th		
Paid John Burrows - - - - - - 47,50		
Abated me for cash - - - - - - - 2,00		
	50	00
13th		
Paid William Lamson in full for his bill on me	150	00
14th		
Sold John Foot 50 barrels of flour, at 12,00 per barrel.		
Received in part, cash - - - - - 350,00		
His promissory note payable in 7 days - - - - - - - - - - 250,00		
	600	00

Boston, May 16th, 1819.	$.	C.
Bought of William Gordon, 40 pieces of bandannoes, at 5,00 per piece - 200,00		
20 do. Pulicat handkerchiefs, at 6,00 per piece - - - - - - - - 120,00		
20 do. India chintz, at 3,50 per piece 105,00	425	00
Paid in cash - - - - - - - - 50,00		
10 bbls. of flour, at 12,00 per barrel 120,00		
Due in 30 days - - - - - - - 255,00	425	00
17th		
I have drawn a bill on John Foot, payable at sight, for - - - - - - - - - -	125	00
"		
John Foot has paid the bill I drew on him	125	00
"		
Sold for cash 15 pieces of India chintz, at 5,00 per piece - - - - - - - - -	70	00
18th		
Sold for cash 30 pieces of bandannoes, at 7,00 per piece - - - - - - - - -	210	00
20th		
Bartered with Joseph Mann,		
5 pieces of Russia sheeting, at 19,00 per piece - - - - - - - - 95,00		
3 do. Moreens, at 10,00 - - - - 30,00	125	00

Boston, May 20th, 1819.	$.	C.
For,		
1 hogshead of sugar, 7½ cwt. at 8,00 per cwt. - - - - - - - 60,00		
200 lb. of coffee, at 0,25 per lb. - 50,00		
20 pair of shoes, at 0,75 per pair - 15,00		
	125	00
21st		
Received of John Foot in full for flour	125	00
23d		
Shipped for Sumatra in the ship Britain, Capt. Colby, consigned to him for sales and returns, 5 pipes of brandy, at 120,00 per pipe - - - - - - - - - - - -	600	00
26th		
Paid premium for Insurance on 600 dollars on voyage to Sumatra, premium at 12½ per cent. - - - - - - - - - - - -	75	00
27th		
Paid James Morgan in full - - - - - -	40	00
28th		
Paid William Gordon - - - - - - - -	255	00
30th		
Paid for house expenses - - - - - - -	37	50

End of the Waste-Book.

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